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THE ARCHITECTS' JOURNAL

standard contents

every issue does not necessarily contain all these contents, but they are the regular features which continually recur

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CURRENT BUILDING
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Details of Planning, Construction, Finishes and Costs
Buildings in the News
Building Costs Analysed

Architectural Appointments Wanted and Vacant

No. 3163] [VOL. 122

THE ARCHITECTURAL PRESS
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★ A glossary of abbreviations of Government Departments and Societies and Committees of all kinds, together with their full address and telephone numbers. The glossary is published in two parts—A to Ie one week, Ig to Z the next. In all cases where the town is not mentioned the word LONDON is implicit in the address.

IGE	Institution of Gas Engineers. 17, Grosvenor Crescent, S.W.1.	Sloane 8266
IHVE	Institution of Heating and Ventilating Engineers. 49, Cadogan Square.	Sloane 1601/3158
IIBDID	Incorporated Institute of British Decorators and Interior Designers. Drayton House, Gordon Street, W.C.1.	Euston 2450
ILA	Institute of Landscape Architects. 12, Gower Street, W.C.1.	Museum 1783
I of Arb	Institute of Arbitrators. 35/37, Hastings House, 10, Norfolk Street, Strand, W.C.2.	Temple Bar 4071
IOB	Institute of Builders. 48, Bedford Square, W.C.1.	Museum 7197/5176
IQS	Institute of Quantity Surveyors, 98, Gloucester Place, W.1.	Welbeck 1859
IR	Institute of Refrigeration. Dalmeny House, Monument Street, E.C.3.	Avenue 6851
IRA	Institute of Registered Architects. 47, Victoria Street, S.W.1.	Abbey 6172
ISE	Institute of Structural Engineers. 11, Upper Belgrave Street, S.W.1.	Sloane 7128
LDA	Lead Development Association. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
LMBA	London Master Builders' Association. 47, Bedford Square, W.C.1.	Museum 3891
LSPC	Lead Sheet and Pipe Council. Eagle House, Jermyn Street, S.W.1.	Whitehall 7264/4175
MAFF	Ministry of Agriculture, Fisheries and Food. 3, Whitehall Place, S.W.1.	Trafalgar 2711
MARS	Modern Architectural Research Group (English Branch of CIAM). Secretary: Trevor Dannatt A.R.I.B.A., 71, Blandford Street, W.1.	Welbeck 4713
MOE	Ministry of Education. Curzon Street House, Curzon Street, W.1.	Mayfair 9400
MOH	Ministry of Health. 23, Savile Row, W.1.	Regent 8411
MOHLG	Ministry of Housing and Local Government. Whitehall, S.W.1.	Whitehall 4300
MOLNS	Ministry of Labour and National Service. 8, St. James' Square, S.W.1.	Whitehall 6200
MOS	Ministry of Supply. Shell Mex House, Victoria Embankment, W.C.	Gerrard 6933
MOT	Ministry of Transport. Berkeley Square House, Berkeley Square, W.1.	Mayfair 9494
MOW	Ministry of Works. Lambeth Bridge House, S.E.1.	Reliance 7611
NAMMC	Natural Asphalte Mine Owners and Manufacturers Council 94/98, Petty France, S.W.1.	Abbey 1010
NAS	National Association of Shopfitters. 9, Victoria Street, S.W.1.	Abbey 4813
NBR	National Buildings Record. 31, Chester Terrace, Regent's Park, N.W.1.	Welbeck 0619
NCBMP	National Council of Building Material Producers. 10 Storey's Gate, S.W.1.	Abbey5111
NEFMAI	National Employers Federation of the Mastic Asphalt Industry. 21, John Adam Street, Adelphi, W.C.2.	Trafalgar 3927
NFBTE	National Federation of Building Trades Employers. 82, New Cavendish Street, W.1.	Langham 4041/4054
NFBTO	National Federation of Building Trades Operatives. Federal House, Cedars Road, Clapham, S.W.4.	Macaulay 4451
NFHS	National Federation of Housing Societies. 12, Suffolk St., S.W.1.	Whitehall 1693
NHBRC	National House Builders Registration Council. 82, New Cavendish Street, W.1.	Langham 4341
N.P.L.	National Physical Laboratory. Head Office, Teddington.	Molesey 1380
NSAS	National Smoke Abatement Society. Chandos House, Buckingham Gate, S.W.1.	Abbey 1359
NT	National Trust for Places of Historic Interest or Natural Beauty. 42, Queen Anne's Gate, S.W.1.	Whitehall 0211
PEP	Political and Economic Planning. 16, Queen Anne's Gate, S.W.1.	Whitehall 7245
RCA	Reinforced Concrete Association. 94, Petty France, S.W.1.	Abbey 4504
RIAS	Royal Incorporation of Architects in Scotland. 15, Rutland Square, Edinburgh.	Fountainbridge 7631
RIBA	Royal Institute of British Architects. 66, Portland Place, W.1.	Langham 5721
RICS	Royal Institution of Chartered Surveyors. 12, Great George St., S.W.1.	Whitehall 5322/9242
RFAC	Royal Fine Art Commission. 5, Old Palace Yard, S.W.1.	Whitehall 3935
RS	Royal Society. Burlington House, Piccadilly, W.1.	Regent 3335
RSA	Royal Society of Arts. 6, John Adam Street, W.C.2.	Trafalgar 2366
RSH	Royal Society for the promotion of Health. 90, Buckingham Palace Road, S.W.1.	Sloane 5134
RIB	Rural Industries Bureau. 35, Camp Road, Wimbledon, S.W.19.	Wimbledon 5101
SBPM	Society of British Paint Manufacturers. Grosvenor Gardens House, Grosvenor Gardens, S.W.1.	Victoria 2186
SCR	Society for Cultural Relations with the USSR. 14, Kensington Square, London, W.8.	Western 1571
SE	Society of Engineers. 17, Victoria Street, Westminster, S.W.1.	Abbey 7244
SFMA	School Furniture Manufacturers' Association. 30, Cornhill, London, E.C.3.	Mansion House 3921
SIA	Structural Insulation Association. 32, Queen Anne Street, W.1.	Langham 7616
SNHTPC	Scottish National Housing. Town Planning Council. Hon. Sec., Robert Pollock, Town Clerk, Rutherglen.	
SPAB	Society for the Protection of Ancient Buildings. 55, Great Ormond Street, W.C.1.	Holborn 2646
TCPA	Town and Country Planning Association. 28, King Street, Covent Garden, W.C.2.	Temple Bar 5006
TDA	Timber Development Association. 21, College Hill, E.C.4.	City 4771
TPI	Town Planning Institute. 18, Ashley Place, S.W.1.	Victoria 8815
TTF	Timber Trades Federation. 75, Cannon Street, E.C.4.	City 5051
WDC	War Damage Commission. 6, Carlton House Terrace, S.W.1.	Whitehall 4341
ZDA	Zinc Development Association. 34, Berkeley Square, W.1.	Grosvenor 6636

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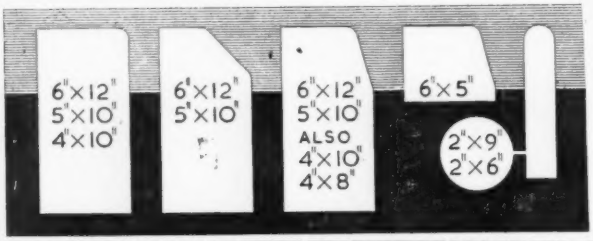

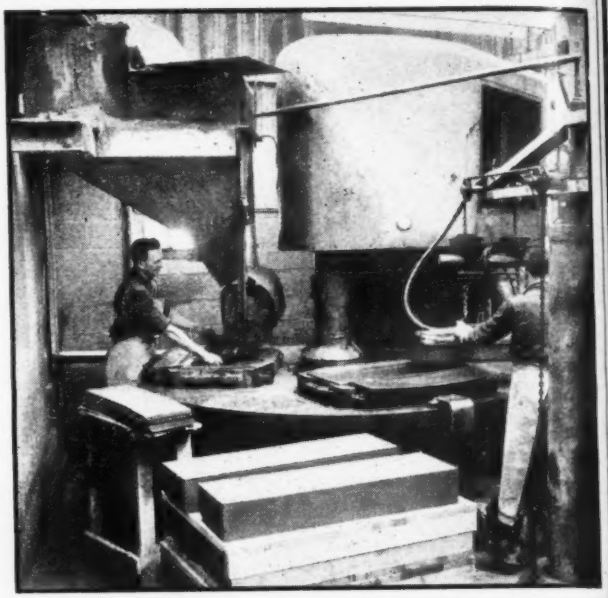

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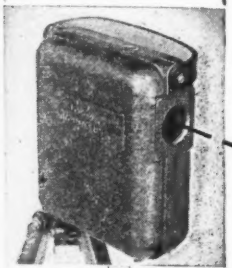

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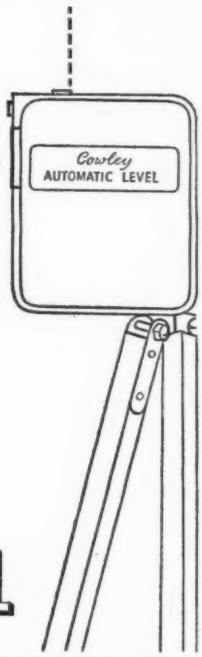

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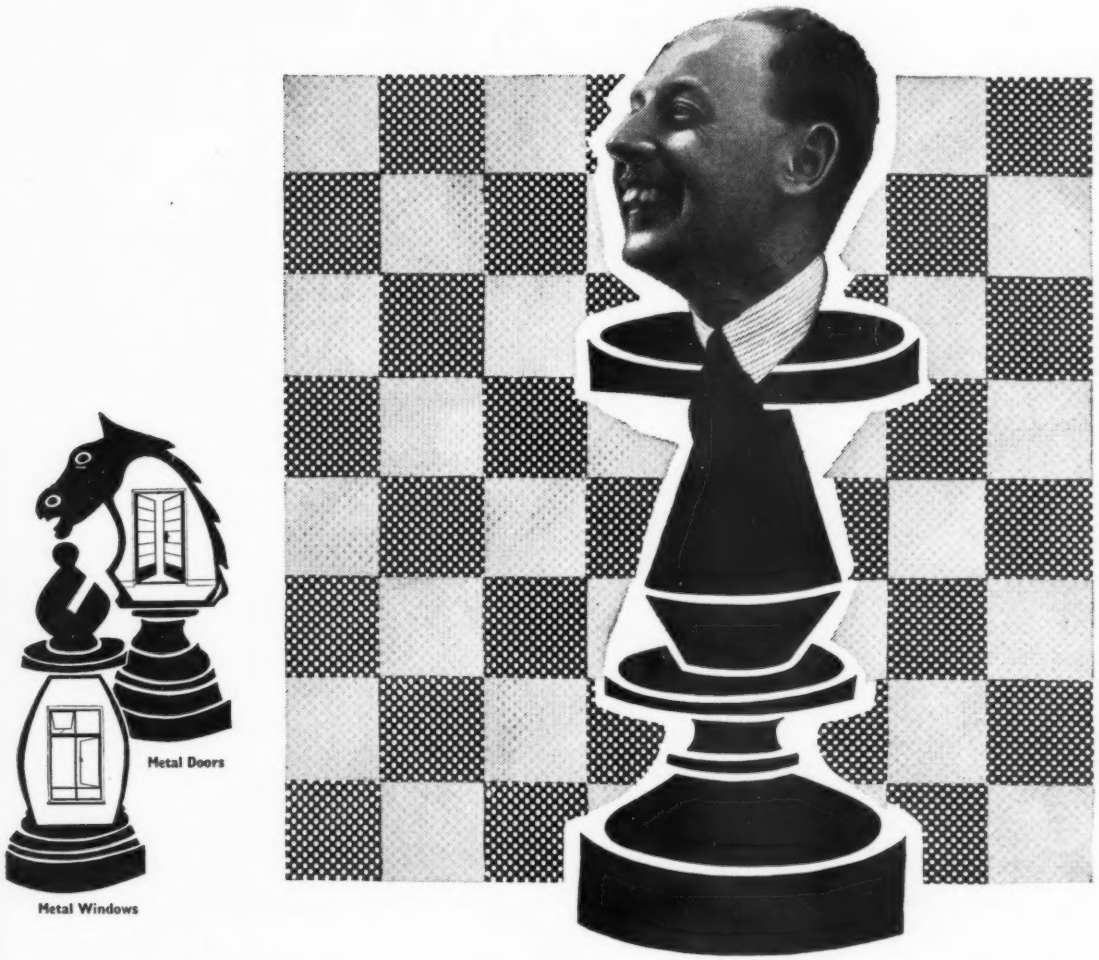

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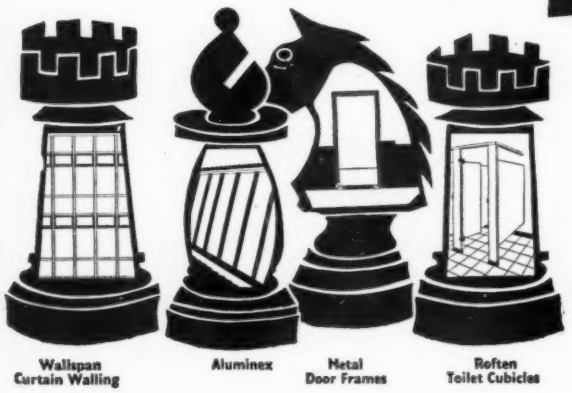

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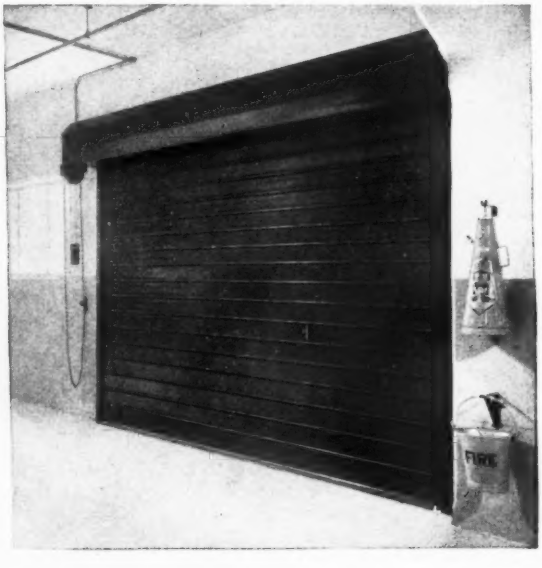

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TRETOL INFORMATION SHEET **For Your Files**

THE USES OF MORTAR PLASTICISERS

The need for reduced costs and greater efficiency is resulting in the increased use of mortar plasticisers throughout the building industry. This information sheet gives a brief description of the function of these workability aids.

THE THEORY governing mortars for brickwork is that the mortar joint should always be weaker than the brick, so that when thermal or moisture movement takes place in the structure as a whole, the joints craze or crack in preference to the possible formation of major structural cracks in the bricks.

To obtain this weak mortar joint it is necessary to use a mix with low cement and high sand content. These mixes often become unworkable, particularly where sharp sands are used and it has been the practice in the past to recommend the addition of hydrated lime as a plasticising agent.

As, however, lime expands and cement contracts during hydration, two opposing stresses are set up in the mortar during the drying out and hardening processes and this is very largely the basic cause of the quite common crazing and movements of joints away from the brickwork. The development of mortar plasticisers now makes it possible to adopt lean cement and sand mixes without resorting to the addition of lime.

Underlying Principles.

Tretol Morta-Mix, the mortar plasticiser, works on the principle of entraining in a mix approximately 10 per cent. more air than normal. This air is in the form of minute stable bubbles, and these, by reducing internal friction within the mortar, provide a marked improvement in plasticity and workability.

The air entrainment is obtained by a physical and not a chemical action and there is, therefore, no deleterious effect on the mortar. Tretol Morta-Mix removes surface tension from the gauging water and to a certain extent, acts as a lubricant for the sand.

Because of the air entrainment the mortar is given a minute cellular construction which provides more tolerance for movement within the mortar, thereby reducing cracking and crazing to a minimum. The thermal insulation provided by this cellular construction of the mortar prevents the penetration of frost beyond the initial face of the mortar or rendering and provides a high degree of resistance to damp penetration.

Mortars for brickwork.

By allowing the elimination of lime the use of Tretol Morta-Mix will enable typical mixes of 1:1:5 or 1:1:6 to be adjusted to 1:6 using, if preferred, coarse sharp sands; Mixes of 1:2:9 and 1:3:12 can similarly be adjusted to 1:8. In addition to easier flow, improved wetting properties of the mortar will be obtained, ensuring better bonding between brick and mortar joints, greatly reducing the tendency to crazing and shrinkage of the mortar joints.

External renderings.

Mixes of 1:6 as indicated for brickwork, using really coarse sharp sands, can well be employed with the aid of this plasticiser without the slightest objection being raised by plasterers. The renderings hang extremely well in their wet state and can be brought to a good finish without necessity for over-trowelling; thus avoiding bringing the "fat" to the surface with resultant crazing. By the use of selected sands, and by employing these lean mixes, a valuable contribution is made towards reducing crazing and shrinkage cracks.

The plastic nature of the mix provided enables very easy working of surfaces to obtain texturing where necessary, also, by improved wetting, better adhesion between thrown or embedded aggregate on to the surface of the final coat of rendering is obtained.

Internal cement renderings for backing coats.

The advantages gained by the use of lean mixes are particularly apparent on breeze blocks and other internal surfaces not possessing high physical strength. Renderings consisting of cement, sand and Tretol Morta-Mix only, eliminating completely the need for lime, will provide excellent backing coats for plaster finishes and will not cause any chemical reaction resulting in blowing, or other physical damage to the setting coats. This will apply to all typical plasters used for work of this nature, including Hemihydrates, Anhydrous, Anhydrites, Keenes, etc.

For further details please write for Tretol Morta-Mix leaflet AJ/1

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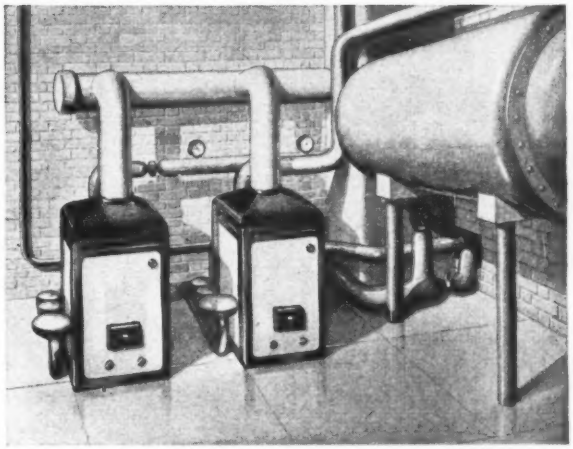

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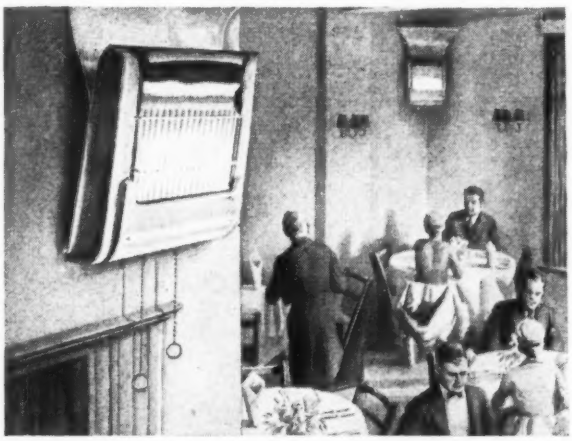

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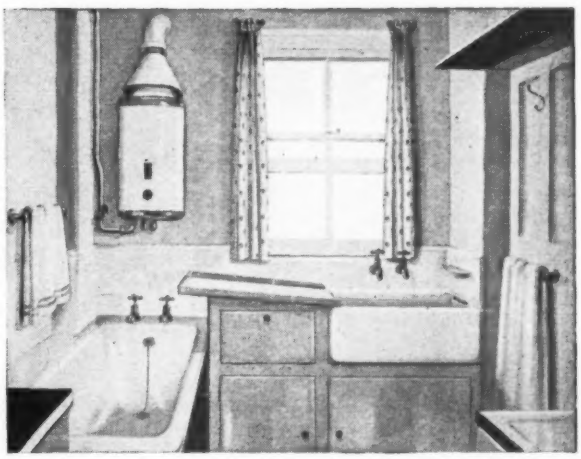

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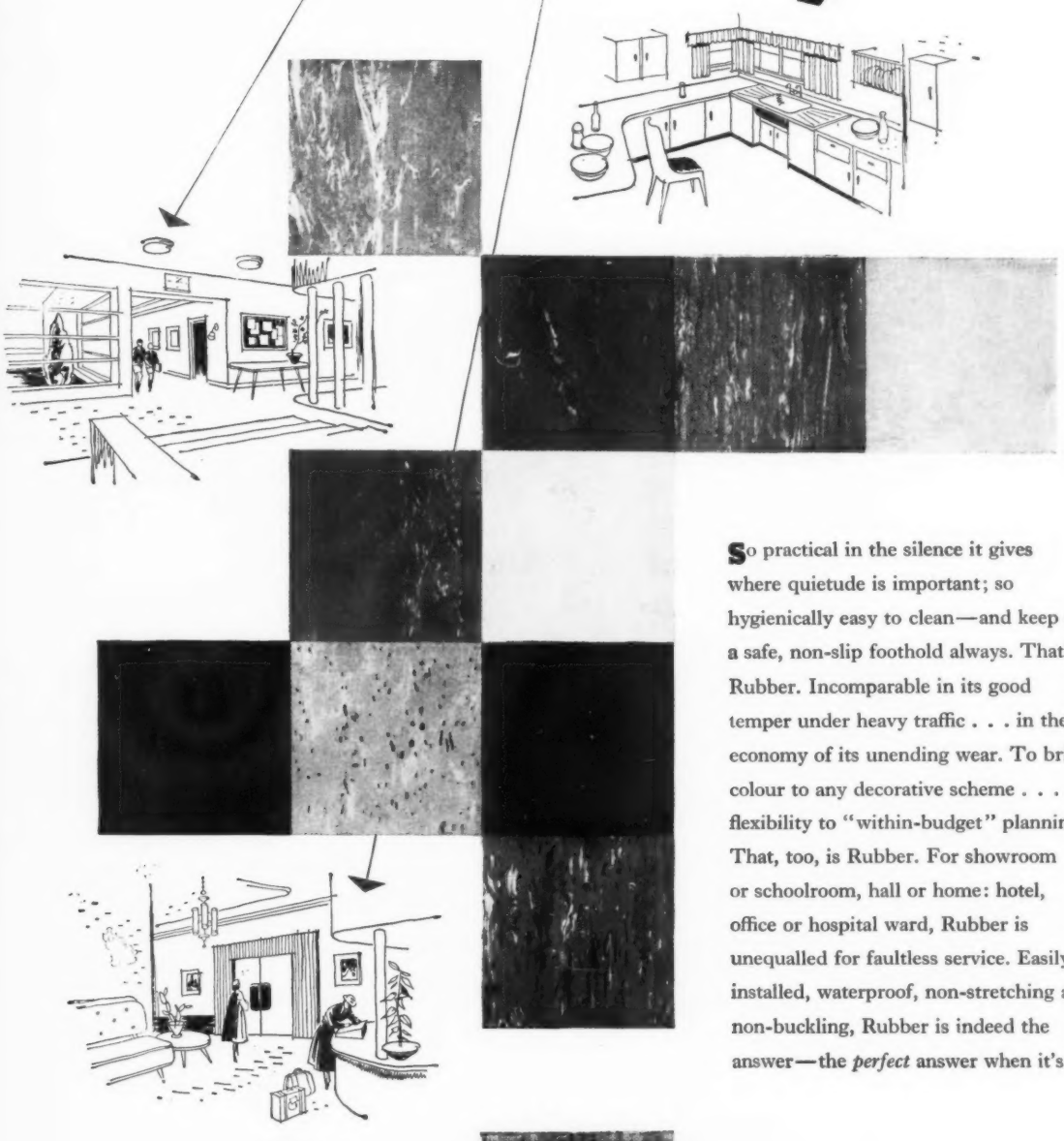

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Thought: I've got it,
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Lancs
Gratefully murmured his
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After doffing his cap
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A fireman, talking aloud
Made this remark to the
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Some boffin, I hear
Has a darned good idea
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There once was a
Scotsman of Fife
Whose packaging
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To a Lorival bloke
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An electrical fellow
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Discovered a terrible
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At a helluva rate
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PVC, in the hands of Lorival's lively lads, can do a lot of jobs better and cheaper. Why not drop a line to Lorival? Then you can get together with the lively lads and figure out ways and means of using PVC to your advantage.

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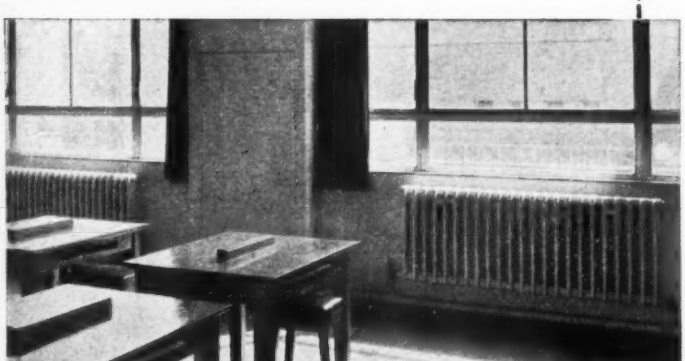

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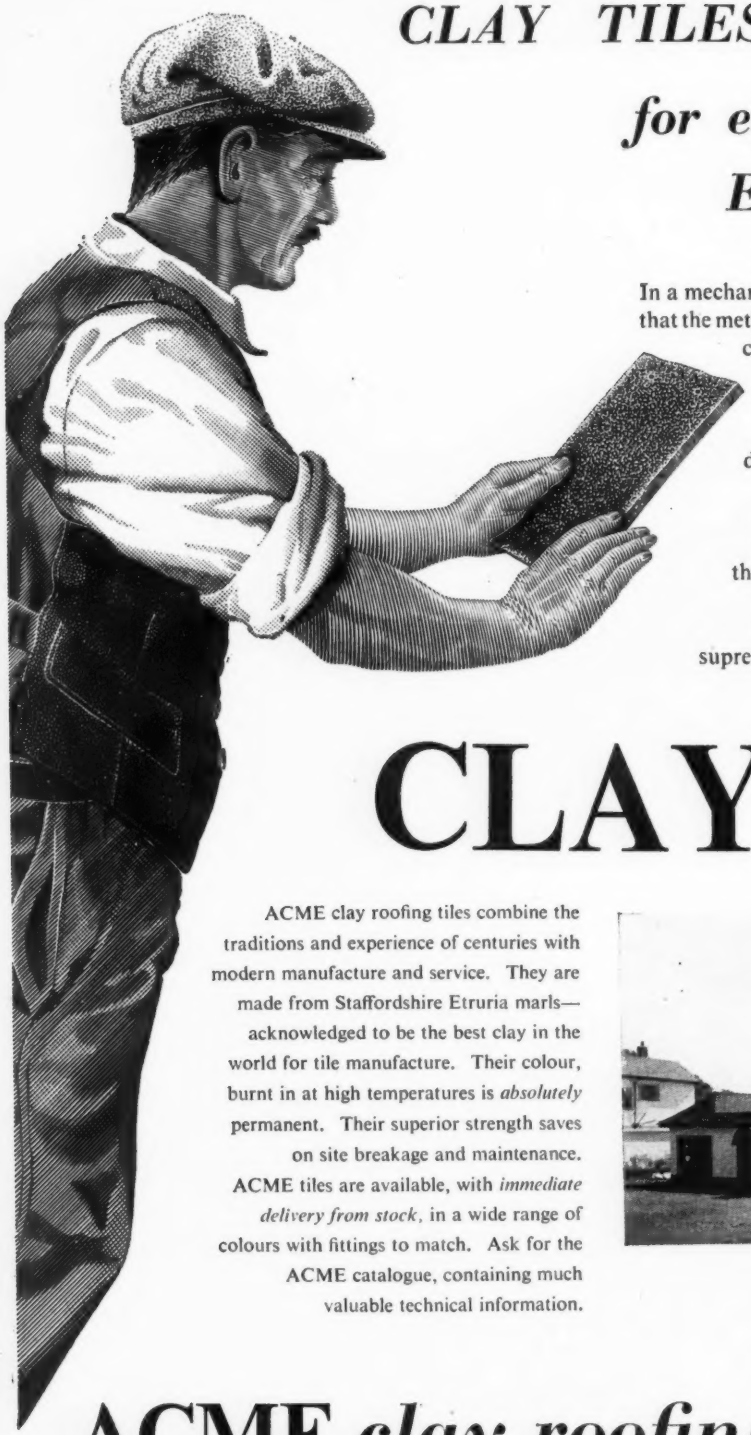

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IT PAYS TO THINK OF DEXION

–at the planning stage

Service Depot builds storage platform. *Iron Bridge Service Depot Ltd. of Southall, Middlesex, built this overhead storage platform to carry 20 tons of motor-car parts. It effects a big saving in space, and the supports also serve as dividers for storage bins. Storage structures of Dexion can make full use of any existing space; and they have the great advantage of ensuring easy adaptability to changing needs.*

A FACTORY LAYOUT must be flexible, capable of being adapted at short notice to changing circumstances. This applies particularly to storage requirements and works equipment.

There is no more versatile material for building stores and equipment, exactly to your own designs, than Dexion Slotted Angle. Such Dexion equipment is quick and cheap to install. And any Dexion structure can be readily adapted and altered to meet changing needs. There is no waste, no scrap: Dexion is fully recoverable, and can be used again and again.

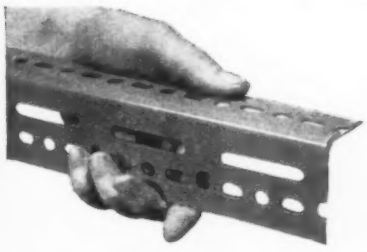
When you are planning the building and layout of a factory, Dexion deserves careful consideration at an early stage. This versatile material may bring about important economies, initially and for years to come.

A technical design and estimating service is available free; and for large installations, construction teams will carry out the work if required.

GET THE FACTS

Dexion 225 is sold in packets of ten 10-ft. lengths, complete with bolts. Steel Dexion (price from 1/3½ to 1/5 per foot) is rust-protected, stove-enamelled. Where a light but strong, non-magnetic, non-corroding material is required, use Alloy Dexion (full technical details and prices on request). Send today for sample piece of Dexion and illustrated booklet AN. 143 showing many uses in industry. Dexion Ltd., 65 Maygrove Road, London N.W.6. (Telephone MAIda Vale 6031-9.)

Machine Shop Engineer's office quickly built. *Thomas Allan & Sons Ltd. of Thornaby designed this office with tool store underneath to be built with conventional materials. They used Dexion instead when they found it was quicker and cost less. In jobs of this sort, Dexion invariably supersedes old-fashioned materials and methods.*

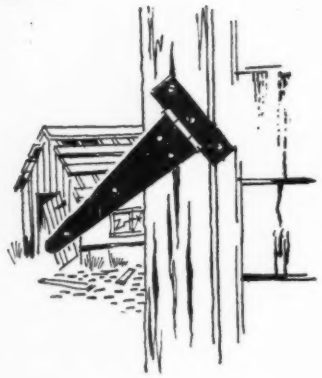


DEXION

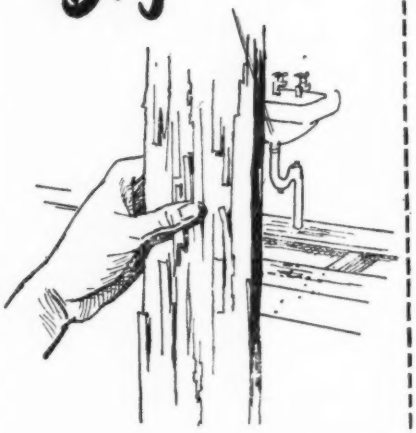
REGD.

SLOTTED ANGLE

Exposure!



Dry Rot!



Insects!

To keep **wood** safe from all forms of rot and decay, use **PRESOTIM**

Presotim is a decorative wood preservative produced from a series of highly refined coal-tar oils blended to provide extra-deep penetration even when applied by brushing.

Presotim is effective against timber decay whether caused by fungi, exposure, or attack by insects such as Death Watch Beetle and Furniture Beetle.

Presotim is recommended for use both outdoors and indoors. Presotim (exterior quality) is suitable for pavilions, outbuildings, fences, gates, boats, barges, and for roof timbers in houses. Presotim (interior quality) preserves panelling, doors, skirtings, etc., without obscuring the natural beauty of the grain.

Presotim is prepared in a special "neutral" grade which makes it especially effective for old and valuable timbers such as church roofs and panelling, where it protects without altering the characteristic colour of the wood.

Presotim-treated timber can be polished or varnished as required.

For work where a thoroughly reliable, well-tried wood preservative is needed, Presotim offers to architects, builders and others long-term protection against decay at very low cost.

HOW PRESOTIM IS SUPPLIED

Presotim is marketed in small containers, 5, 10, and 40-gallon drums. It is available in neutral grade, three shades of brown and twelve other attractive colours.
Prices from 4/- per gallon in 40-gallon drums.

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THE NATIONAL COAL BOARD

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A.C. SWITCH SOCKETS AND PLUGS

Right at every point!

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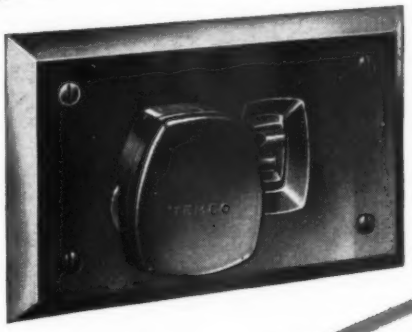
TEMCO A.C. Switch Sockets are small, attractive and individually packed. They conform to British Standards and I.E.E. Wiring Regulations.



WIRING RIGHT

Easy wiring is a notable feature of the new TEMCO A.C. Switch Sockets and Plugs. Heat Resistant Back Plates for the Surface Types are available to form an enclosure for the Cable Sheath.

PRICE RIGHT

You can confidently use TEMCO accessories even if low initial cost is important. Despite their high quality they are not expensive — proving that the best is really the cheapest.

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there's nothing quite like **hardec**

the *balanced* board with the 'built-on' decorative plastic surface

Hardec, the new surfacing and decorating material, has made its mark. This balanced board, with all the tough, decorative qualities of laminated sheet *plus* the dimensional stability only balance can give, was designed to fulfil a particular purpose: all-round economy at the highest quality. Now, specified by more and more architects, used by an ever-increasing number of builders, Hardec has proved itself up to the hilt. It cuts costs directly—Hardec is decidedly less expensive than similar quality materials; and indirectly—Hardec is simpler to use, and its balanced construction minimises the possibility of dimensional instability. The architect who specifies Hardec knows it will match his intentions: to the builder Hardec brings the profit of a job well done, and to the client, lasting satisfaction.

Balanced Construction *Hardec has a colourful hard-wearing melamine plastic surface, a hardboard core, and a plain plastic backing. This balanced construction minimises dimensional instability.*

Attractive Colours *There is a wide range of clearer, cleaner colourful linen prints—including buff, green, pink, blue, grey and a variety of natural wood grain finishes. Hardec wipes clean with a damp cloth and the colours and patterns never fade or lose their freshness.*

Long Lasting *The Hardec surface is scratch- and chip-resistant and is not readily marked by tea, coffee, fruit juices, alcoholic drinks, weak acids and many chemicals, steam or boiling water, and it is resistant to cigarette burns.*

Many Uses *Hardec is ideal for partitions, panels, ceiling and wall linings, flush door facings, splash panels and table tops. It is finding ever-increasing use in houses, schools, factories, restaurants, bars, shops—and many other applications.*

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Made by the manufacturers of Weyroc man-made timber

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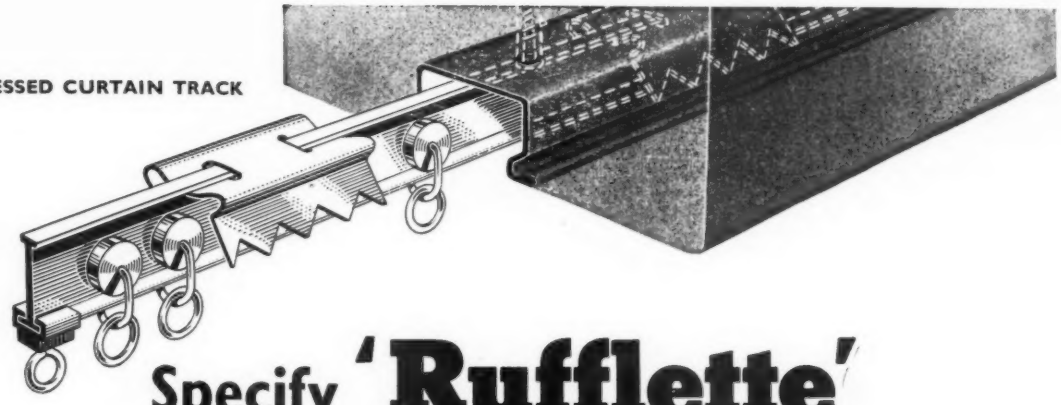
RECESSED CURTAIN TRACK



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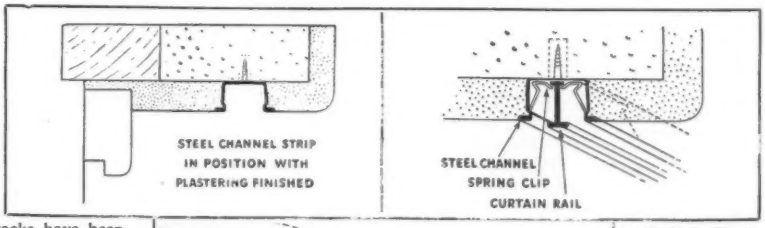
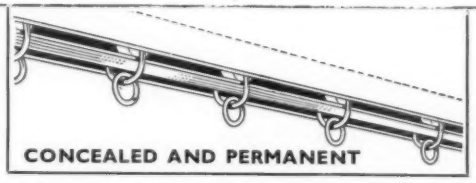
" Rufflette " Brand Recessed Curtain Track represents the perfect method of curtain suspension, being concealed, permanent and inexpensive. It is an integral part of the structure and can be fitted into wood or plaster lintels. The track is locked in position by a patent spring clip without screws. Many architects specify this product in new buildings.

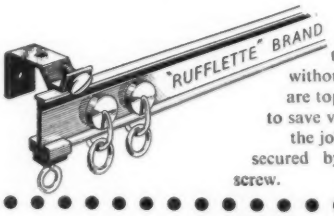


" Rufflette " Brand Tracks have been installed by many local authorities including Ilford, Wandsworth, Lewisham, Willesden, Finchley, Wood Green, Poplar, Wimbledon, Greenwich, Stoke Newington, Islington, Holborn, Leyton & West Ham Borough Councils. Also London, Bucks, Surrey, Middlesex & Essex County Councils.



CONCEALED AND PERMANENT

Cubicle Track installations have been made for many hospitals including Edgware Gen., Mount Vernon, Richmond, Bushey Maternity, Northwood & Pinner Gen., Liverpool Stanley East Suffolk & Ipswich, Southmead Bristol, Newcastle Gen., Darlington, Warrington Infy., and the Liverpool Royal Infy., and also for many municipal undertakings.

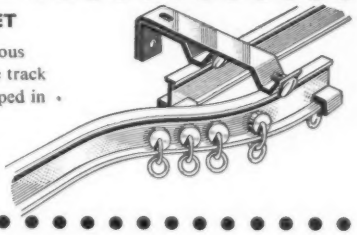


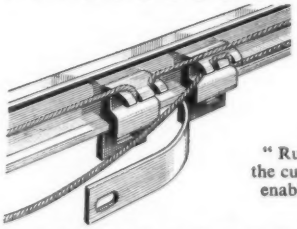
B/L TYPE TRACK

A strong track for all types of window, with or without cord control. Brackets are top or face fixing, designed to save valuable time and cost on the job, the track being rigidly secured by a single front-facing screw.

OVERLAP BRACKET

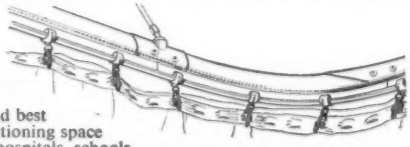
In order to give a generous overlap for curtains, the track can be cut and over-lapped in the centre, using the special BL7 bracket.





CORD CONTROL

On straight track curtains can be effortlessly opened and closed with this " Rufflette " Cord Control. Note the curved travelling section which enables curtains to be overlapped without cutting the track.



CUBICLE TRACK

The simplest and best method of partitioning space by curtains, in hospitals, schools, hairdressing establishments, clinics and stores. Suspension is from ceiling or wall and silent runners make the operation of curtains almost inaudible.

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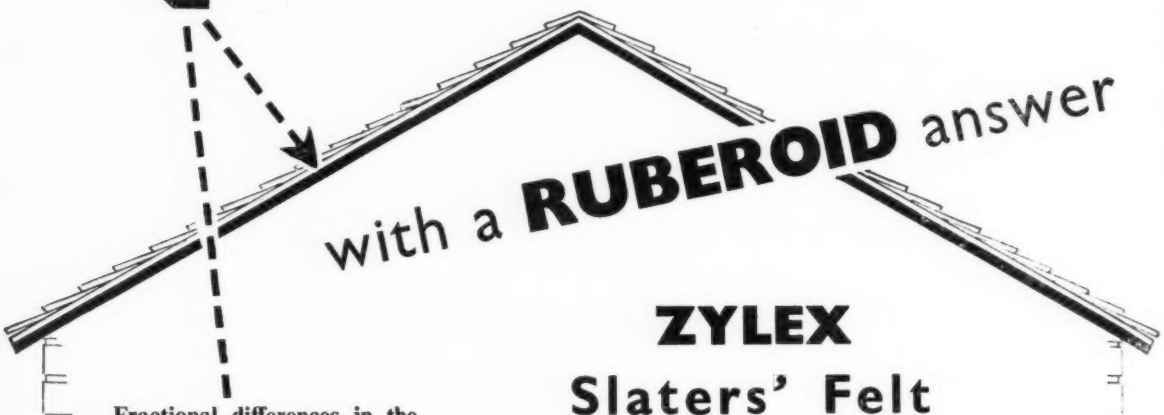

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B ZA195

GLOSSARY AND SYMBOLS

GLOSSARY OF TERMS

Continued from GS. 1.

Definitions of electrical terms in general usage that may concern the architect are given below, and on GS.1, with brief explanations. The symbols are taken from British Standard 108: 1951, Section 19: Location Symbols for Electrical Installations. They refer particularly to the purpose of the outlets and not specially to electrical apparatus.

Load Factor : The proportion expressed as a percentage of the number of units used or generated to the number that would have been used or generated if the maximum load had been maintained steadily and continuously. That is to say if a motor in a factory runs fully loaded for 44 hours a week and 50 weeks in a year, its load factor is

$$\frac{44 \times 50}{24 \times 365} = 25 \text{ per cent}$$

The present load factor of Britain's electricity supply is about 45 per cent. If it could be increased it would tend to reduce the cost of electricity by making greater use of the generating plant. Any electrical appliance in use during ' off peak ' hours tends to improve the load factor.

Low Voltage or Low Tension : Normally does not exceed 250 volts.

Mains : Any electric line (whether underground or overhead) through which electricity may be supplied for the purpose of general supply. A ' service line ' (q.v.) is not a main.

Maximum Demand : The greatest rate of consumption of electricity. In most cases the maximum demand for the purpose of an electricity supply tariff is taken as twice the largest number of units used or generated in any half-hour. There are, however, various other methods of determining the maximum demand, but there is no precise definition.

Medium Voltage : Normally exceeds 250 volts, but not 650 volts.

Megawatt : 1,000,000 watts, i.e. 1,000 kW.

Meter : A measuring instrument. That used to measure a public supply of electricity is a kWh meter and indicates the number of units (kilowatt-hours) used. A kWh meter in which the insertion of a coin enables a predetermined amount of electricity to be obtained is called a ' prepayment ' or ' slot meter '.

Milliamp : A thousandth of an ampere.

Multi-heat Switch : A switch providing different degrees of heat output from say, a boiling plate on an electric cooker, e.g. by grouping the heating elements in parallel (together or singly) or in series or series-parallel combinations. Using two elements, up to four different heats can be obtained, or with three elements as many as nine heats. Multi-heat control is also obtained by using ' tapped ' transformers (see ' Transformer ') or by periodical movement of thermally operated contacts which provide infinitely variable heat control.

Negative : The ' return wire ' in D.C. circuits only. The negative terminal is usually either painted black or marked with the symbol (—).

Neon : A rare gas. When a current of several thousand volts is passed through a glass tube containing neon gas under reduced pressure, a red glow is produced. Other rare gases produce different colours. Transformers are used to supply the high voltage necessary.

Neutral Conductor (Neutral Wire) : The middle conductor of a three-wire or four-wire system. The neutral is usually ' earthed ', and under conditions of balanced load carries no current. In a three-wire D.C. system it is at an intermediate pressure between the positive and the negative conductors, and so is called ' the neutral'.

Ohm : The unit of electrical resistance. A resistance of one ohm will pass a current of one ampere when a potential difference of one volt (D.C.) is applied at its ends. This fundamental relationship between current and voltage is known as Ohm's law. It is also applicable to A.C. but only at unity power factor.

Parallel : Conductors or circuits are said to be in parallel when they are so arranged as to cause an electric current to divide and subsequently to reunite. The conductors need not lie parallel in a geometrical sense. Electric lamps are wired in parallel in ordinary installations. See also ' Multi-heat Switch'.

Positive : The ' flow wire ' in D.C. circuits only. The positive terminal is usually painted red or marked with the symbol (+).

Potential : Electrical pressure. Usually measured in volts.

Power Factor : An effect that occurs only with A.C. and is difficult to explain in a few words. Broadly speaking it is the ratio of useful current to the total amount flowing in a circuit. In circuits containing only lighting or heating apparatus the power factor is 'unity' but with electric motors it may fall to 0.8 or lower unless corrected by adding capacitors.

TABLE 6 BELLS

Bell push outlet	
Multi push	
Bell	
Buzzer	
Indicator N equals number of ways	
Bell transformer NOTE: May be used for any special L.V. purpose	

TABLE 7 TELEPHONES

Telephone point, public service	
Telephone board, public service	
Telephone point, internal	
Telephone board, internal	

TABLE 8 CLOCKS

Synchronous clock outlet	
Impulse clock outlet	
Master clock	

TABLE 9 FIRE ALARMS

Fire push	
Automatic contact	
Bell connected to fire alarm	
Fire alarm indicator N equals number of ways	

GS.2

TABLE 10 PUBLIC ADDRESS SYSTEM

Amplifier	
Control board	
Microphone outlet	
Loud speaker outlet	

TABLE 11 RADIO RECEPTION OUTLETS

Special outlet for receiver	
Loud speaker outlet	
Aerial	
Earth	

TABLE 12 MISCELLANEOUS

Fixed point (requirement unspecified, characteristics to be given in drawing or schedule)	
Outlet for motor to fixed fan	
Outlet for motor to ceiling fan	
Fan regulator	
Cooker control unit	
Cooker control unit with socket outlet	
Earth (general symbol)	

P.V.C. Cable : A cable having the conductors insulated with Polyvinyl chloride plastic.

Rectifier : A device without moving parts used for converting alternating current into direct current.

Resistance : The resistance that a conductor or appliance offers to the passage of current. It is measured in ohms and is equal to the voltage divided by the current in amps. (See ' Ohm'.)

Ring Circuit : A circuit or main arranged in the form of a ring or loop as distinct from a single open-ended length.

Rupturing Capacity : The rating of a fuse or circuit breaker measured by the amount of power (in kVA) that it is designed to interrupt.

Series : Conductors or circuits are said to be in series when an electric current passes first through one and then through the other.

Service Charge : The charge made by an Electricity Board for providing a service line.

Service Line : Any electric line (whether underground or overhead) through which electricity may be supplied to a consumer from a main. When such a service line is extended to supply another consumer, the extension is called a ' sub-service ' .

Slip-ring Motor : A type of A.C. induction motor in which the current in the revolving winding is controlled (through slip rings and brushes) by means of an external resistance that improves the starting torque.

Squirrel-Cage Motor : The simplest type of induction motor for use with A.C., in which the revolving windings are in the form of a squirrel cage and have no external electrical connections. As the cage is, in effect, a short-circuited winding, the starting current is high unless reduced (to comply with the Electricity Board's requirements) by a ' star-delta ' or ' auto-transformer ' starter that reduces the applied voltage during the starting period.

Standing Charges : Those charges that remain unaltered whether electricity is being used or not.

Substation : Any premises or enclosure containing apparatus for transforming or converting electricity (with or without switchgear), and large enough to admit the entrance of a person when the apparatus is in position.

Switch-Fuse : A switch and fuse combined in one case.

Thermostat : A device for maintaining a constant temperature by automatically closing or opening a circuit as may be necessary.

Three-Phase A.C. : An A.C. system employing either 3 or 4 conductors, in which the changes in direction of the current in the three ' phase ' conductors do not occur at the same time, but in a regular sequence. Such a system has certain economic and technical advantages, both as regards transmission, distribution, transformation, and for power purposes. (See also 'Alternating Current '.)

Three-Pin Plug : A plug connecting a portable appliance to the mains, having two pins for the supply of current, and a third pin to enable the appliance to be ' earthed ' through a third conductor. Three-core flex must, of course, be used, and in this way the metal case or handle of the appliance is prevented from becoming live, should a breakdown of insulation occur.

T.R.S. Cable (Tough Rubber Sheathed) : A cable covered with a tough rubber compound to afford protection against mechanical damage.

Transformer : A piece of electrical apparatus without moving parts, that enables the pressure of a supply of A.C. to be raised or lowered. It consists essentially of coils of insulated copper wire, wound on a core of laminated soft iron, and works on the principle of electro-magnetic induction.

Turbo-Alternator : An alternator driven by a turbine, either direct-coupled or through reduction gearing.

Unit of Electricity (or Kilowatt-hour or ' kWh') : The unit of electrical energy corresponding to a power of one kilowatt (1,000 watts) sustained for one hour, or equally, for example, two kilowatts for half an hour. Thus a 60-watt lamp will, in approximately 17 hours, consume 1,000 watt-hours or one unit.

V.R.I. Cable : A cable having the conductors insulated with vulcanised rubber.

Volt : The unit of electrical pressure. The national standard for domestic and lighting purposes is 240 volts.

Watt : A unit of electric power. With D.C., volts × amps. = watts. (See Kilowatt.)

Wiring Rules : See I.E.E. Regulations.

For further details apply to

GS.2 British Electrical Development Association

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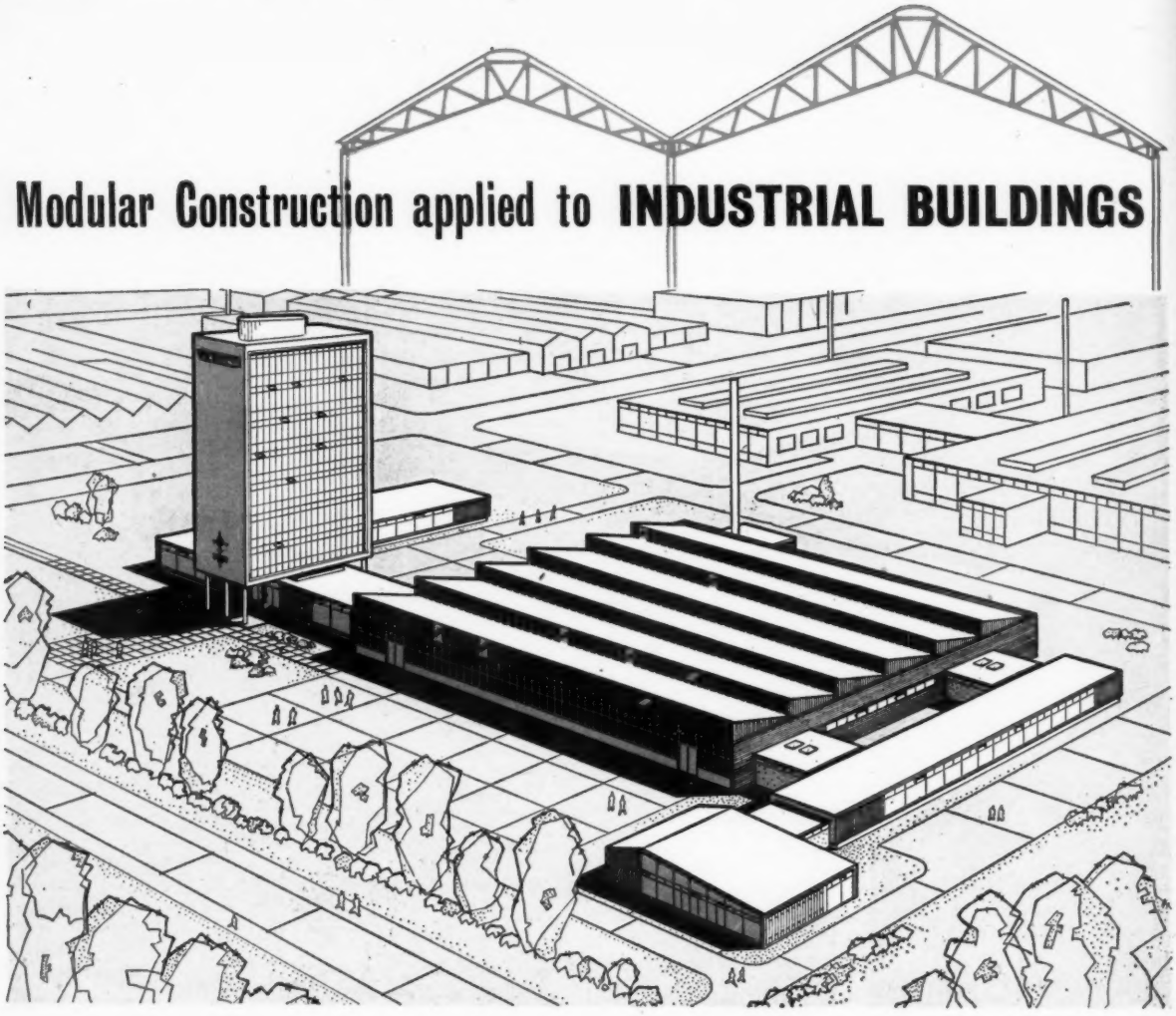

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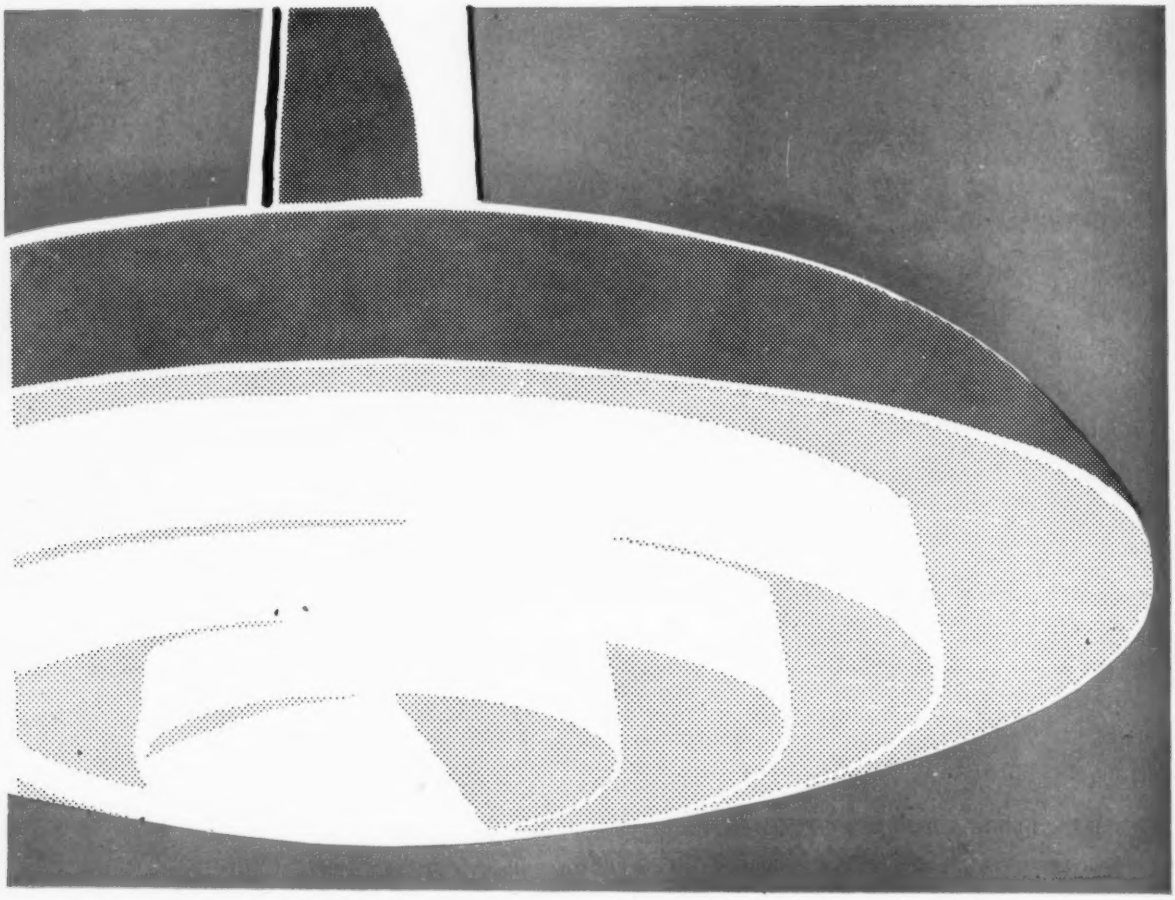

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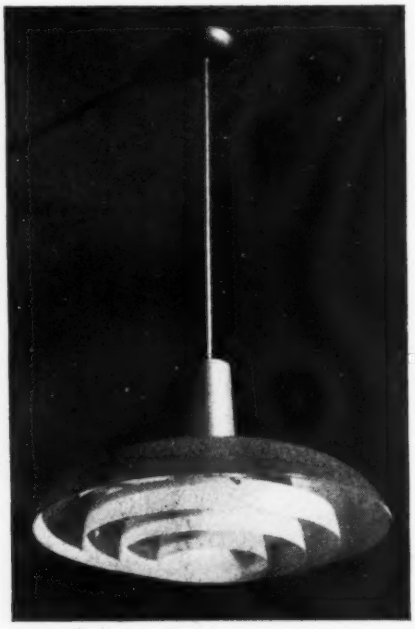

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Interior of the Royal College of Surgeons finished in Olimatt Enamels. (Photograph by courtesy of The Royal College of Surgeons. Architects: Young & Hall).

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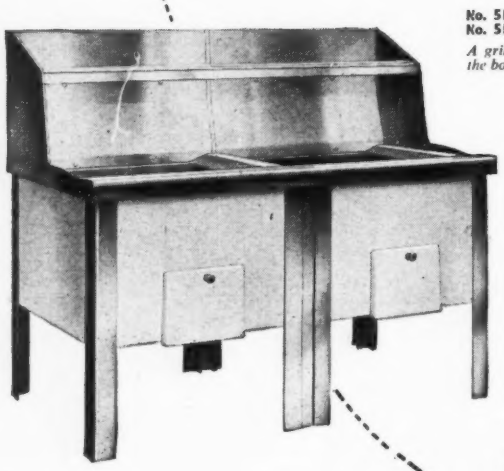

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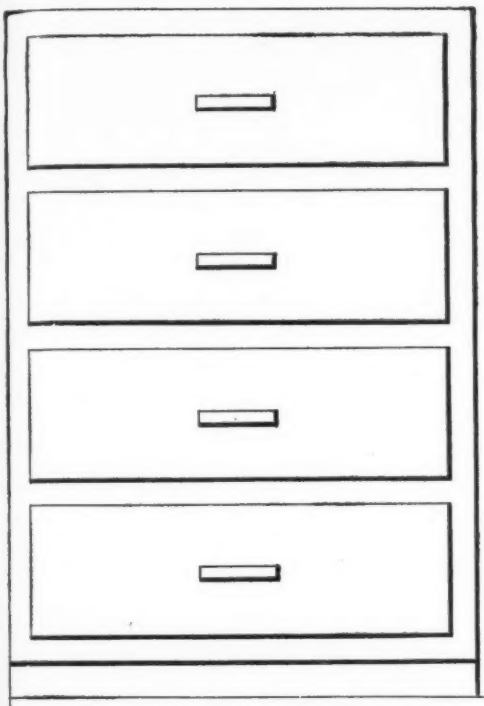

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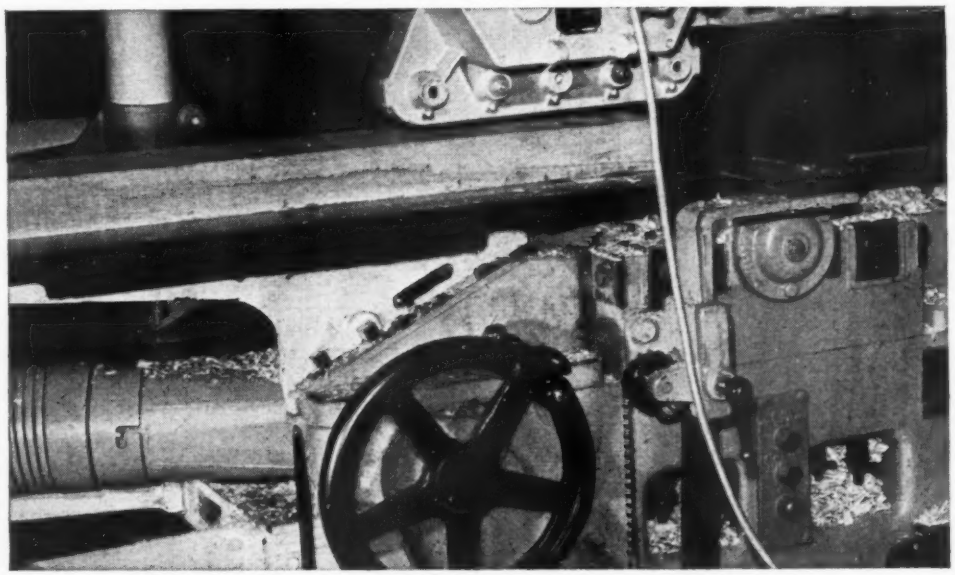

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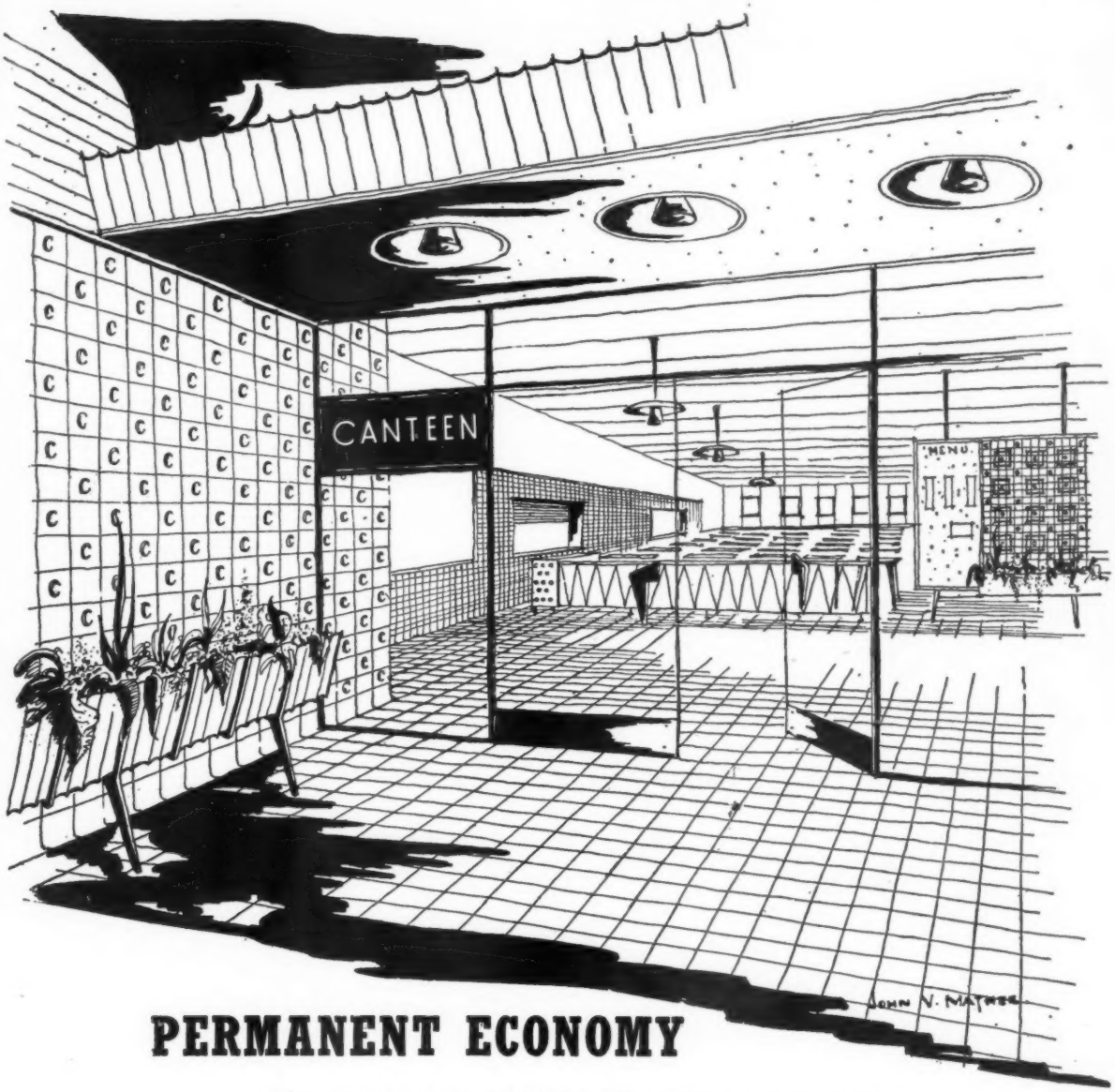

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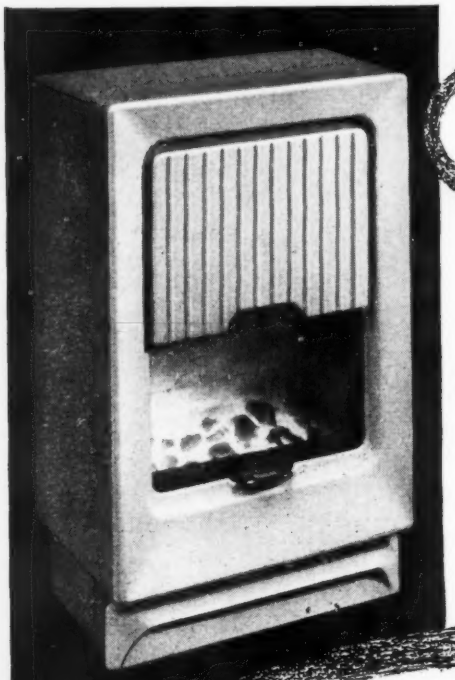

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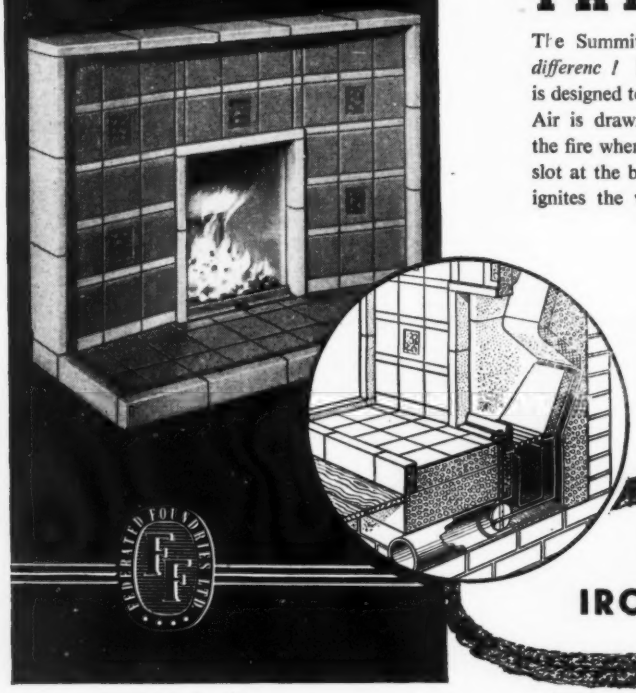

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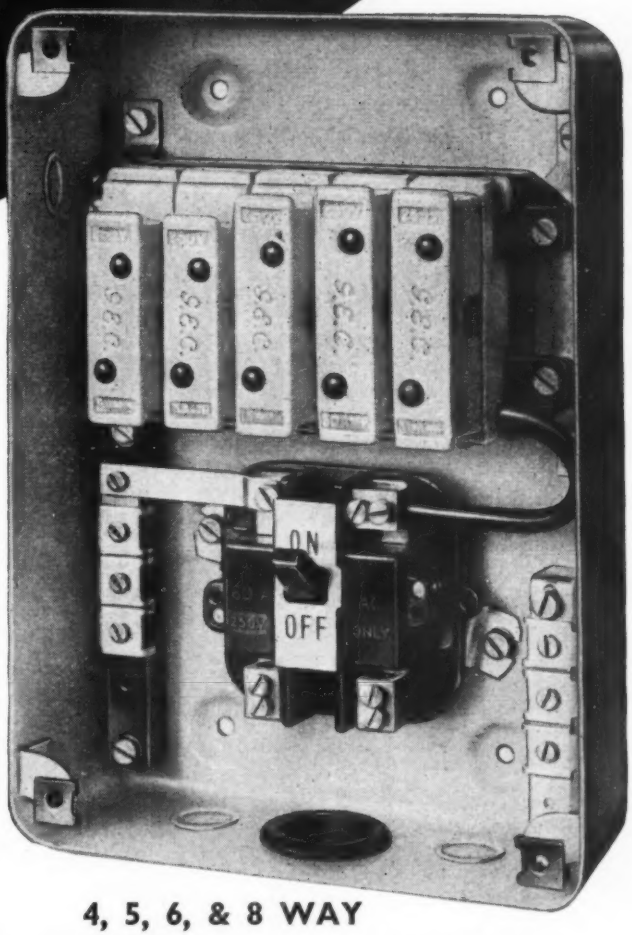

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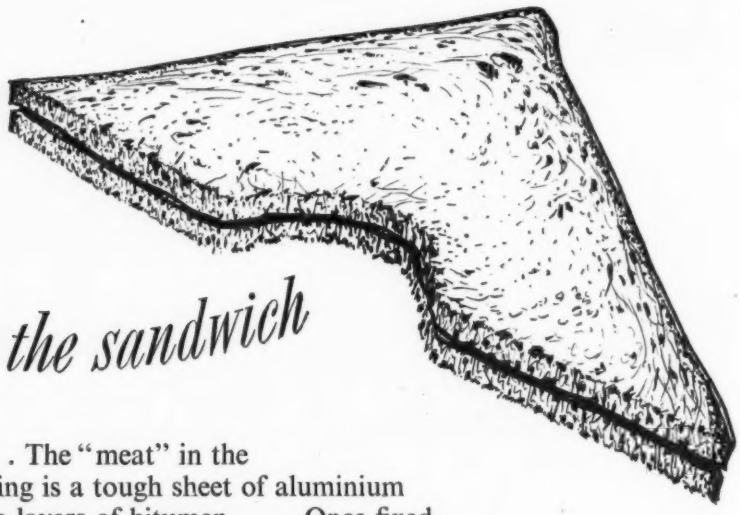

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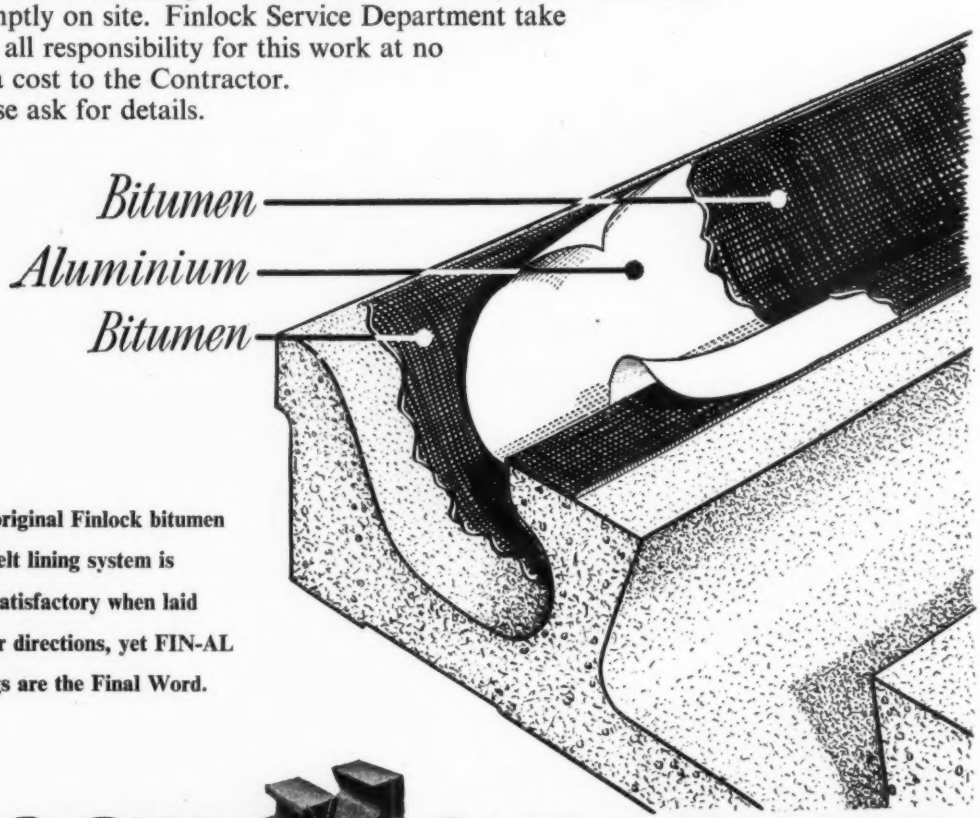

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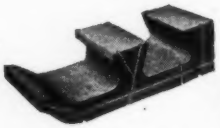

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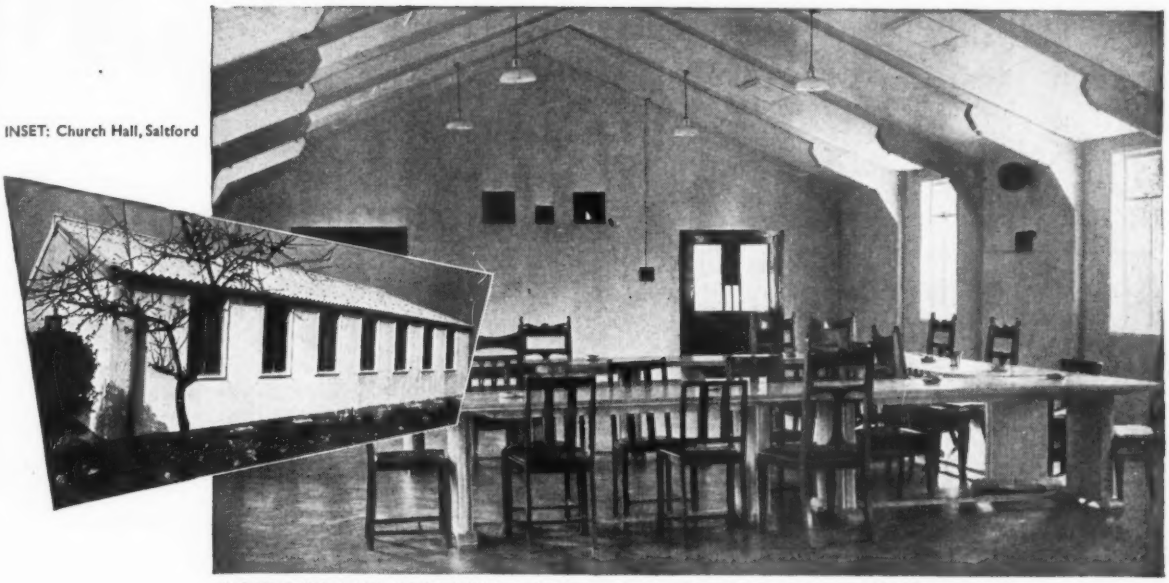

INSET: Church Hall, Saltford

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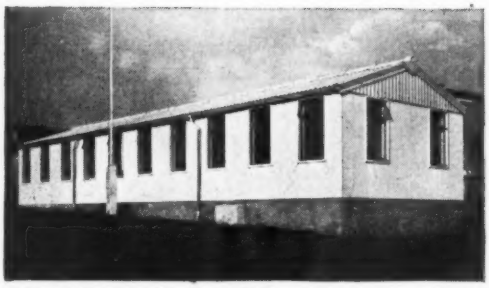

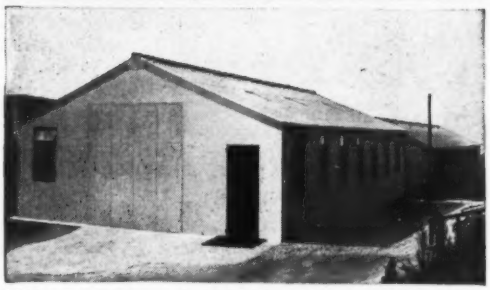

Top Left: Additional Class Rooms–Weirfield School, Taunton.
Centre: Workshop–Littlesea Camp, Weymouth.
Bottom Left: Offices–Canteen–Salisbury Machine Tools (Letchworth) Ltd.
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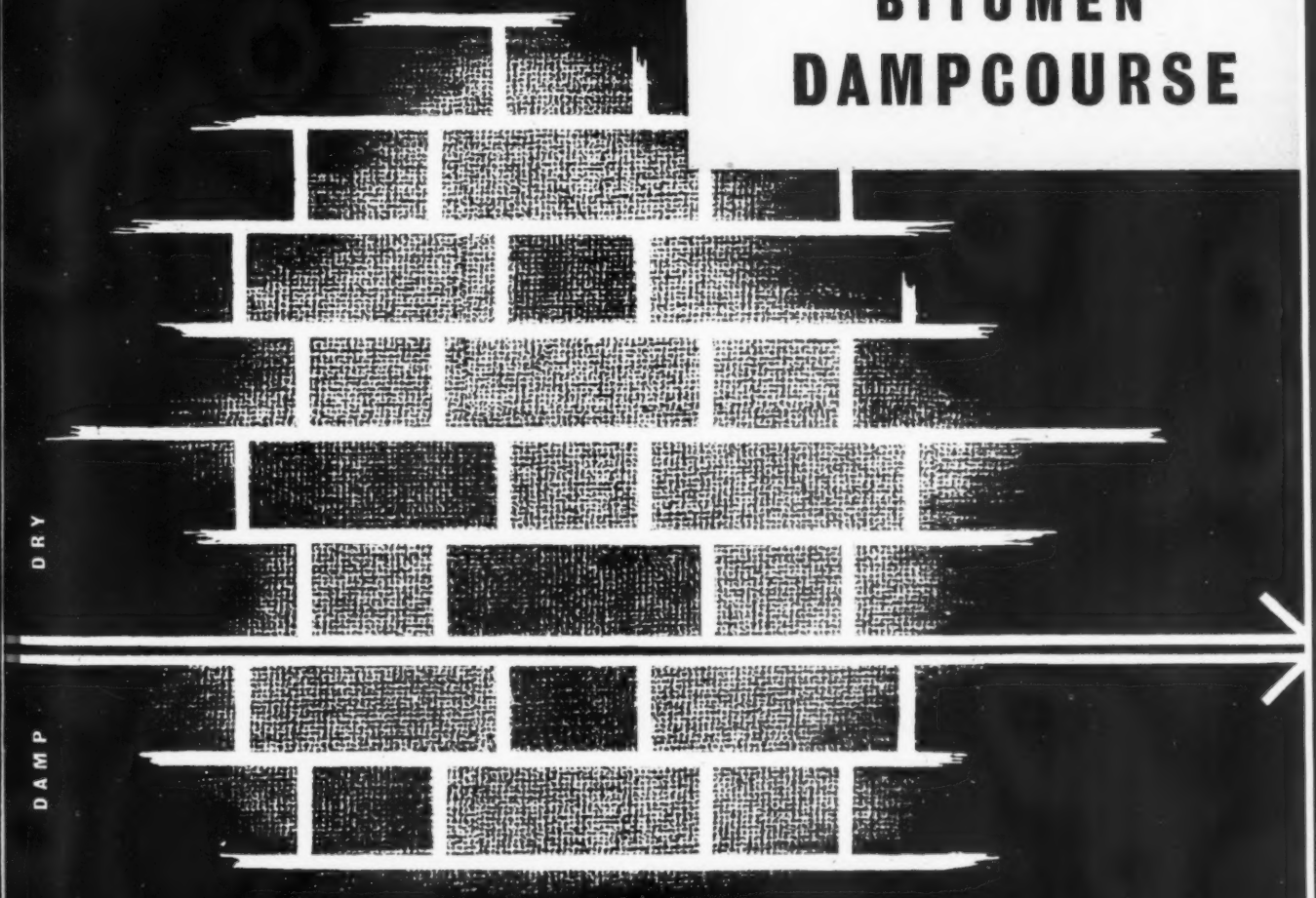

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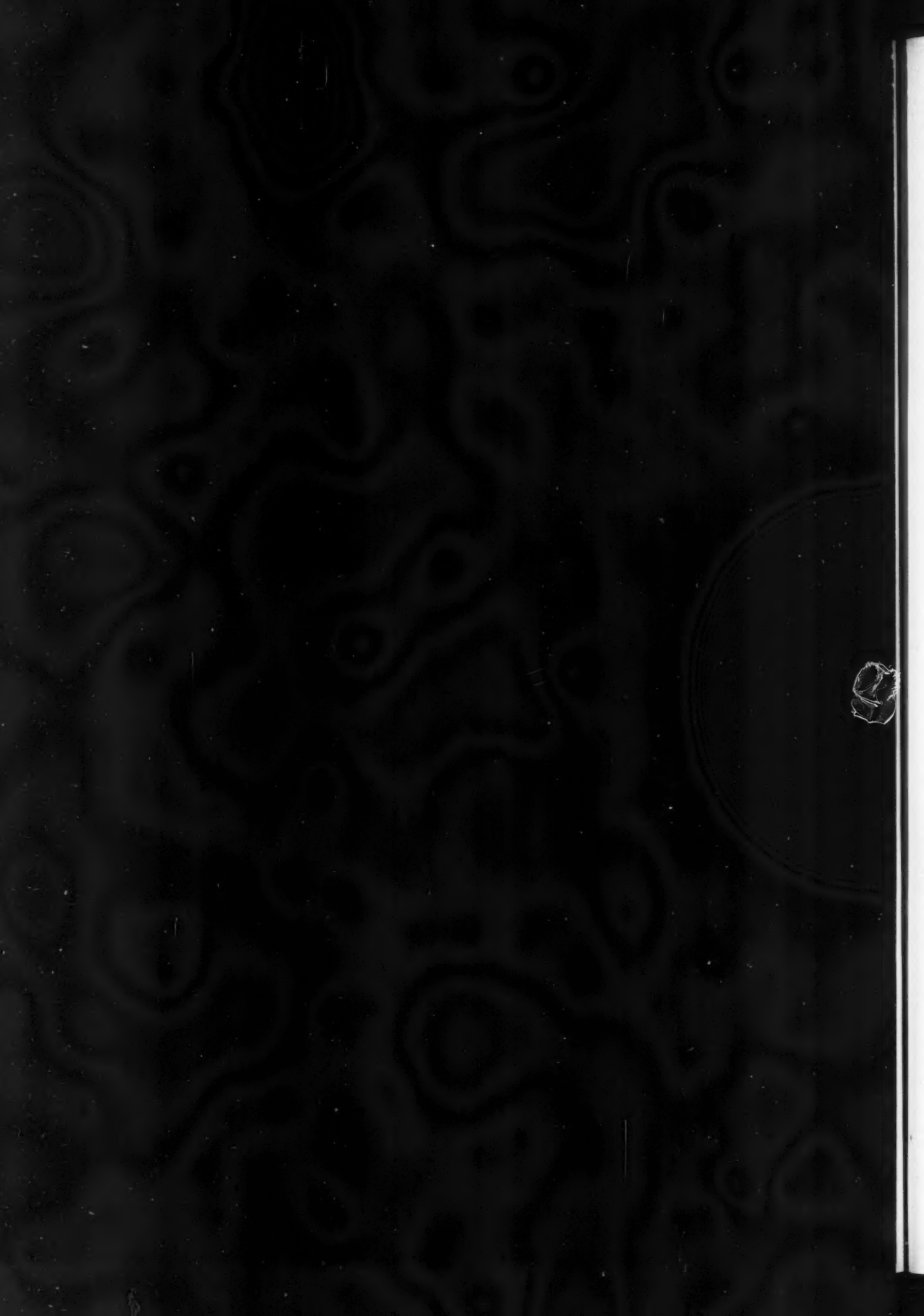
Reproduced here is figure of Canadian White Pine

This advertisement is one of a series featuring Canadian Douglas Fir, Spruce, Red Pine, Pacific Coast Hemlock, and Western Red Cedar



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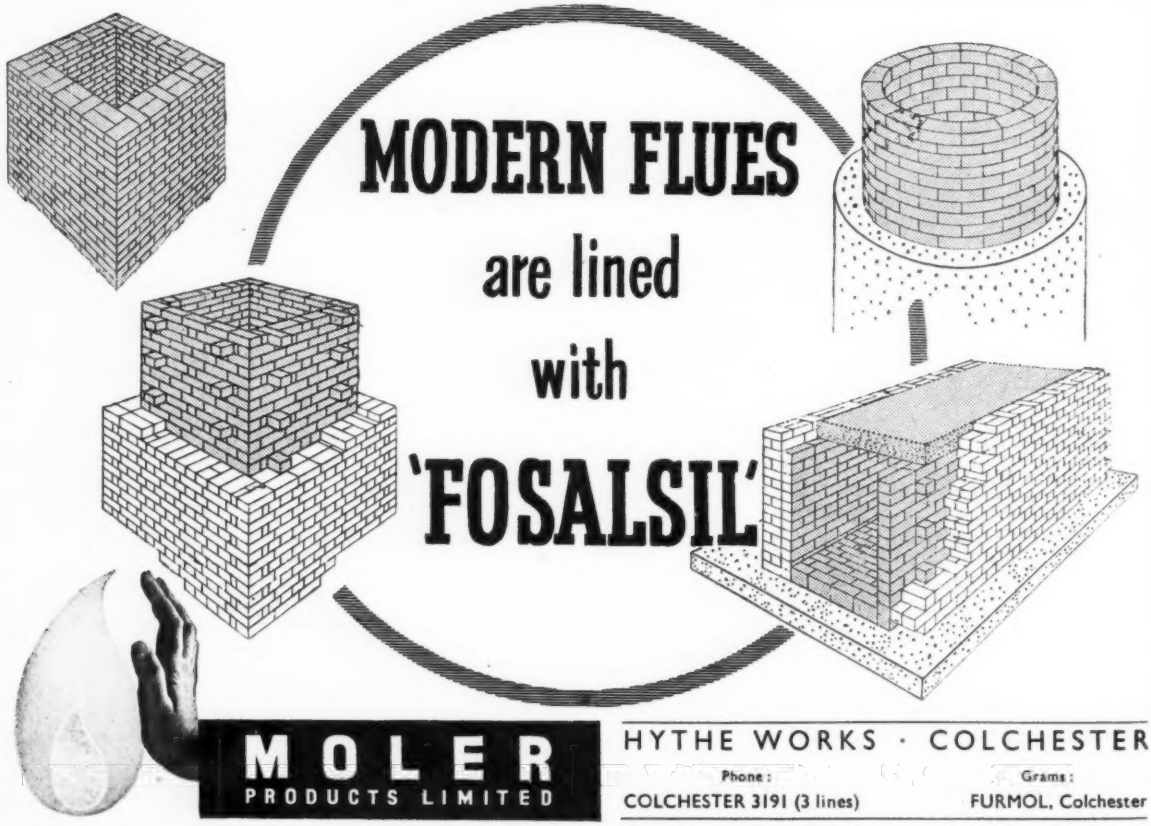

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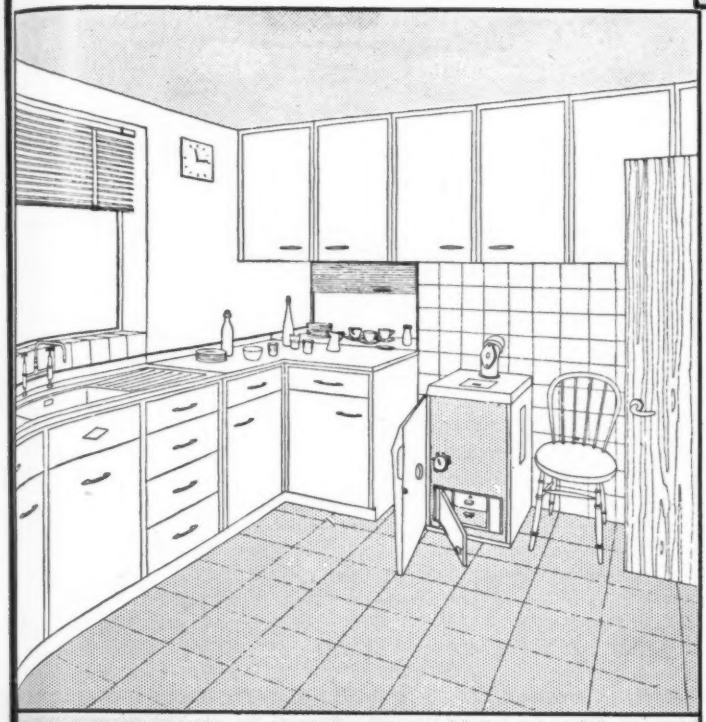

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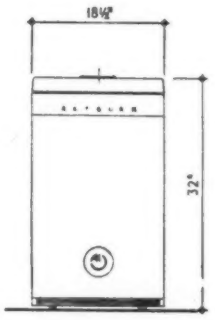
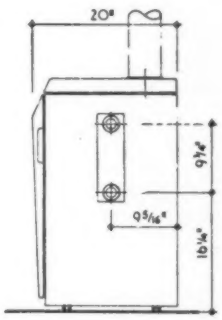
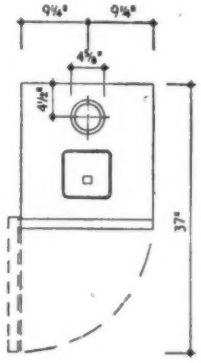


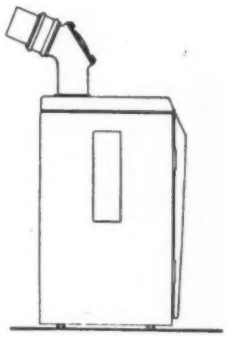
FRONT ELEVATION



SIDE ELEVATION
showing vertical outlet when fitted in recess



PLAN



SIDE ELEVATION

PERFORMANCE

The Rayburn is highly flexible in output and when supplying domestic water only, it is suitable for connection to cylinders of 30 to 60 gallons capacity.

When used in conjunction with a 30 gallon indirect cylinder the boiler will heat up to 75 sq. ft of radiation surface, including unlagged piping, in addition to supplying domestic hot water.

When used to heat radiators only, 150 sq. ft of radiation surface, including unlagged piping, may be heated.

For further details about the RAYBURN BOILER write to the Housing Division of—

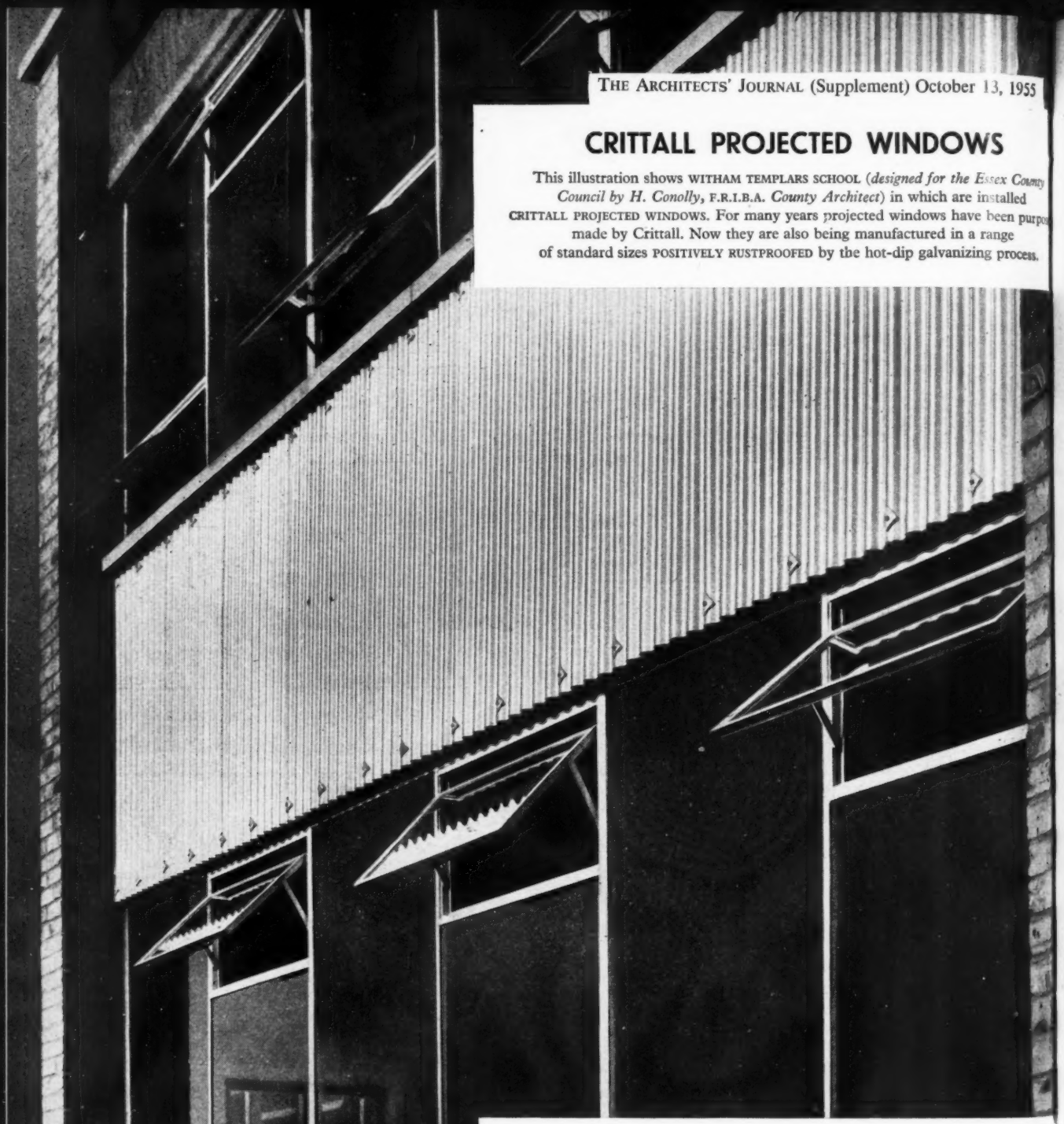
ALLIED IRONFOUNDERS LTD

Makers of cookers, boilers and fires

28 Brook Street, London, W.1.

CRITTALL PROJECTED WINDOWS

This illustration shows WITHAM TEMPLARS SCHOOL (*designed for the Essex County Council by H. Conolly*, F.R.I.B.A. *County Architect*) in which are installed CRITTALL PROJECTED WINDOWS. For many years projected windows have been purpo made by Crittall. Now they are also being manufactured in a range of standard sizes POSITIVELY RUSTPROOFED by the hot-dip galvanizing process.



If you should ever visit the Crittall factory at Braintree (and you would be w welcome) you would observe many products which have never featured i Crittall catalogue—and some that never will. For Crittalls look upon it as important part of their work in windows to be experimenting with the new a improving the old. The Crittall projected windows are a case in point. Bef reaching the stage of development shown in the recently published leaflet 1 you may be sure that they have passed every critical test of quality and perfor ance as a product worthy of the Crittall organisation.

CRITTALL

THE CRITTALL MANUFACTURING CO. LTD · BRAINTREE · ESS

Branches and Depots throughout the country *Members of the Metal Window Associ*

raw61

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Reservoir, Cleadon, Northumberland. Engineer: A. G. McLellan, B.Sc., A.M.I.C.E., M.I.W.E., Sunderland & South Shields Water Co. Contractors: W. Moss & Sons Ltd.

To make sure of the highest standards in concrete design and construction, at the lowest cost in steel, money and time, call in the TWISTEEL Design Service. Their specialist knowledge, backed by many years of practical experience, enables them to advise architects and engineers, with certainty, on every aspect of design and planning for every type of construction involving the use of reinforced concrete: and they can also supply the reinforcement.

TWISTEEL DESIGN SERVICE

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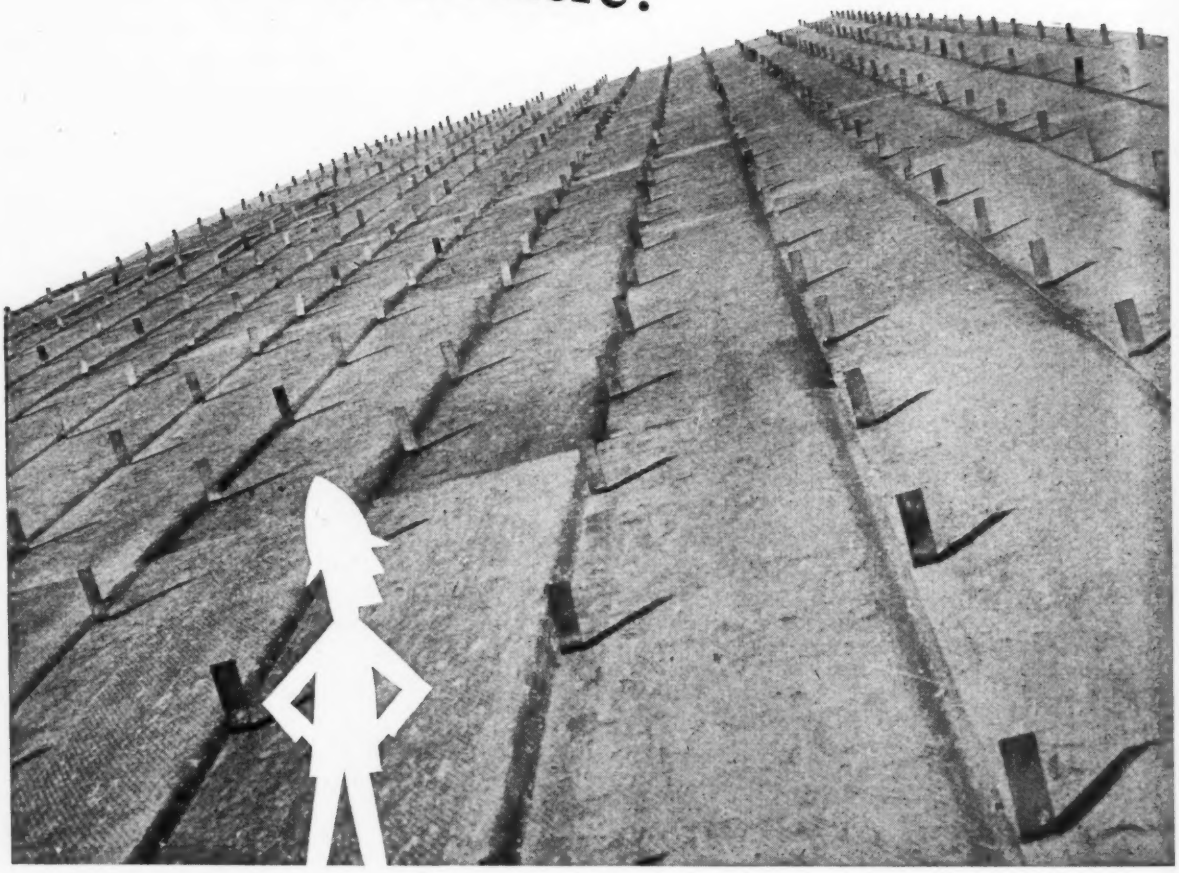
AND AT BIRMINGHAM MANCHESTER GLASGOW

What's going on here?



The above illustration could suggest a number of things; perhaps a plantation in its early stages or even a cemetery for pets. It is, in fact, a stage in the laying of copper to a shallow-pitched roof with the clips firmly anchored to the decking.

Braby have, for more than a century, been the leading specialists in Copper Roofing and examples of their work are to be seen on many Cathedrals, Churches, Public Buildings, Colleges, Factories, Docks, etc. The Braby Technical Staff is always available for consultation on questions of Copper, Aluminium or Zinc Roofing.

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OLD ROADSIDE HOTEL SOLVES HOT WATER PROBLEM

The Cotswold Gateway Hotel at Burford, Glos.

SADIA WATER HEATERS

CUT DOWN RUNNING COSTS
GIVE VALUABLE ADDITIONAL SPACE
MAKE POSSIBLE DRAUGHT BEER TRADE

Messrs Hunt, Edmunds & Co Ltd, the Banbury brewers, are carrying out extensive modernisation of their several properties in the Cotswolds. The latest to be completed is the beautiful old Cotswold Gateway Hotel at Burford, on the main London/Cheltenham Road (A.40), owned by Wayside Inns Ltd (a subsidiary of Hunt, Edmunds & Co Ltd). The alterations were planned by Hunt, Edmunds' architectural staff, and here too as on other occasions Sadia Water Heaters of various capacity were installed. Before this, hot water was supplied by solid fuel boilers which, together with the coal, were housed in the two main cellars. These cellars are now used for stocking beer in barrels and this makes possible a profitable retail trade in draught beer. But more important is the fact that there is now *ample* and *constant* piping hot water for guests' rooms and bathrooms, for the manager's flat and for use in the bar, kitchen, pantry and everywhere else. Wayside Inns Ltd. find that this simple, dependable and cleaner SADIA way provides a substantial saving in staff and running costs.

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HOT WATER BY ELECTRICITY

SAFE · CLEAN · ECONOMICAL

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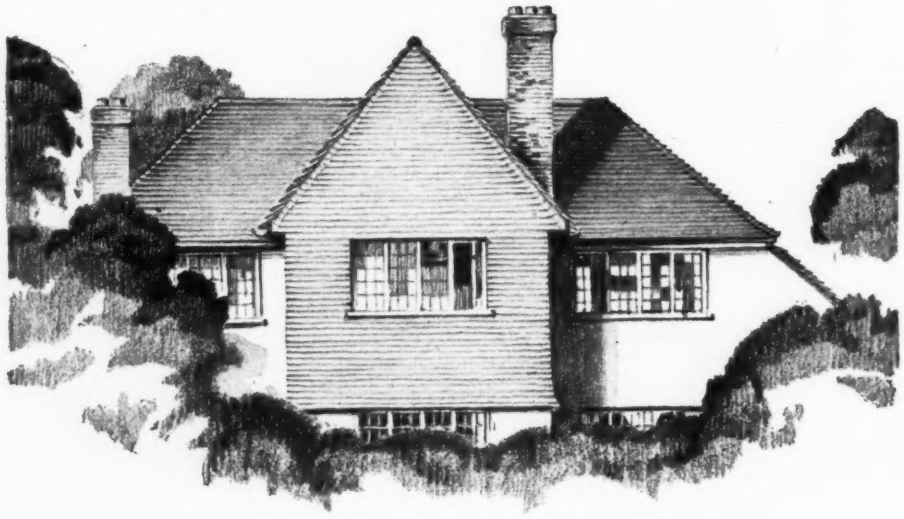
THE ROOF

is much too conspicuous...



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THE REAL THING

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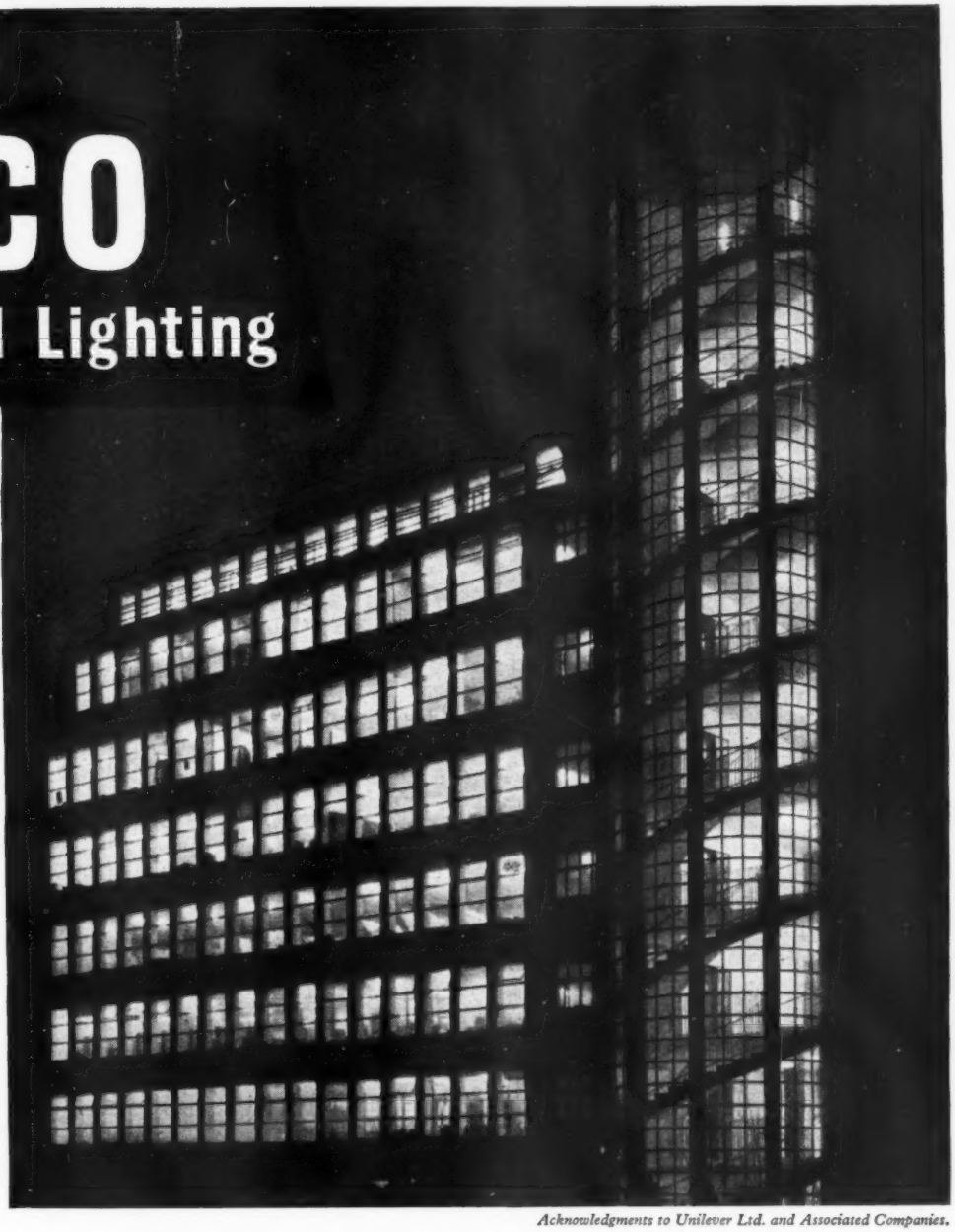
CLAY Roofing Tiles

'The Clay Tile Bulletin', post free on request.

Issued by The National Federation of Clay Industries, Drayton House, W.C.1.

EKCO
Planned Lighting



Acknowledgments to Unilever Ltd. and Associated Companies.

THIS MAGNIFICENT NEW BUILDING (St. Bridget's House, London) occupied by Unilever Ltd., and Associated Companies has been equipped throughout with EKCO Fluorescent Lighting Fittings.

The lighting installation was planned by the Technical Division, Engineering Department of Unilever Ltd., and this untouched night photograph demonstrates the high standard of glare free lighting which has been obtained with EKCO Fittings designed in a matching range covering 5ft., 4ft., 3ft. and 2ft. units so that a pleasing uniformity has been obtained in private offices, general offices, corridors and landings.

The EKCO 130-page Lighting Catalogue will gladly be sent on request and our illuminating engineers will be pleased to call to discuss any problems associated with fluorescent lighting.

EKCO-ENSIGN ELECTRIC LTD

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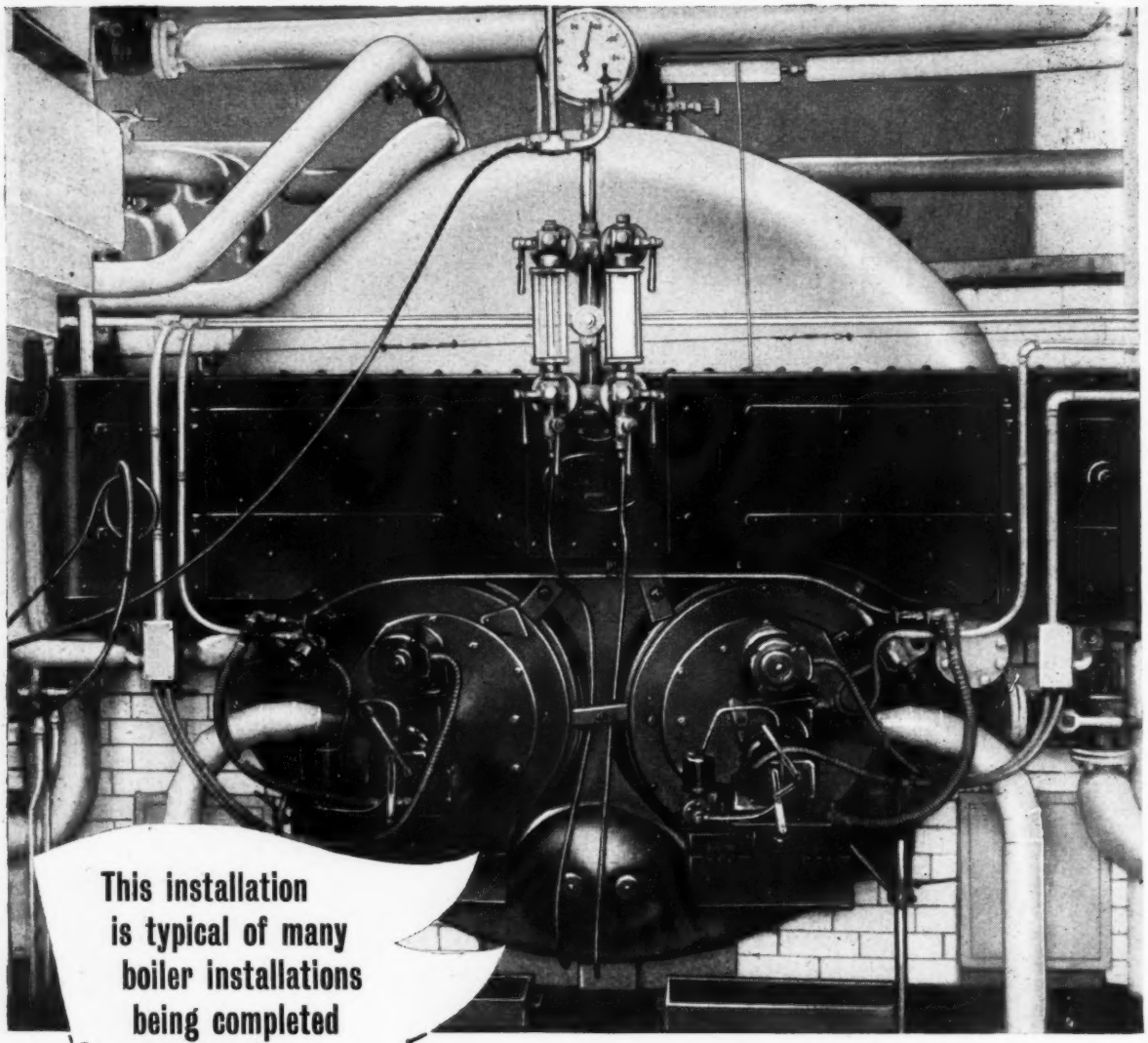

This installation is typical of many boiler installations being completed by HYDRA

This photograph shows part of the boiler room of British Transport Hotels and Catering Services' Laundry, Willesden, by whose courtesy it is reproduced.

MAKE NO MISTAKE—*if it's oil-firing, ask HYDRA!* Each burner is precision engineered, consisting of a self-contained unit, which occupies minimum space in front of the boiler, and which offers you these special advantages :

POWER-DRIVEN ROTARY CUP. NO JETS. NO FILTERS. PATENTED METERING PUMP, PROVIDING FINGER-TIP CONTROL OF BURNER OUTPUT. BURNS ANY VISCOSITY FUEL, INCLUDING 3,500 SECONDS OIL OR EVEN 100% WASTE.

Leading industries throughout Britain use HYDRA OIL FIRING EQUIPMENT for topmost efficiency and utmost economy

Write now for full details of HYDRA, "Britain's foremost oil-firing equipment". Special methods of application for Cochran and other vertical boilers. Enquiries invited.

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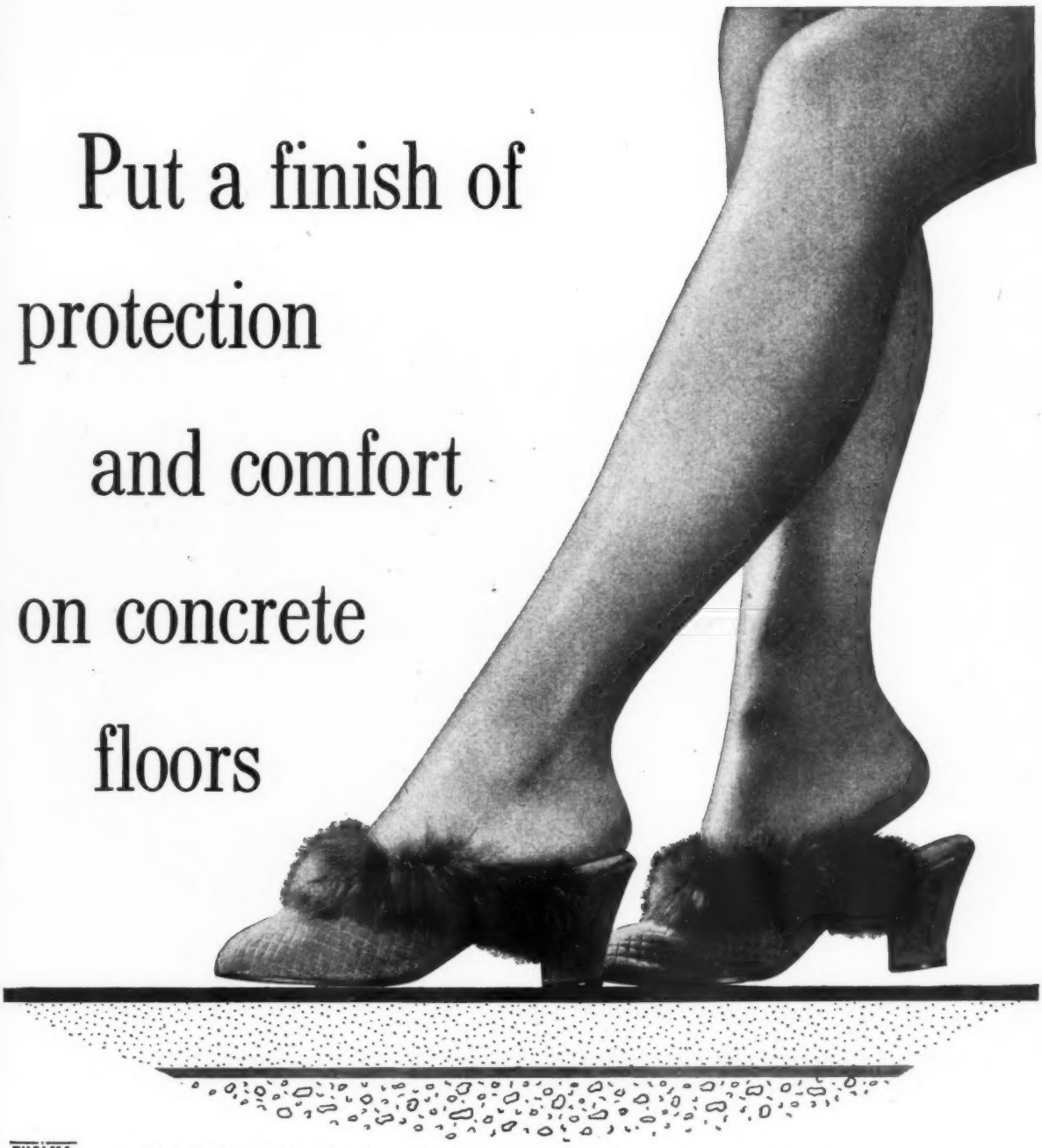
Put a finish of protection and comfort on concrete floors



THELMA

. . . stands for The Linoleum Manufacturers' Association, 127 Victoria St., London, S.W.1. For further information write to the Association or to any of the following members:—

Barry Ostlere & Shepherd Ltd., Kirkcaldy
Dundee Linoleum Co. Ltd., Dundee
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Linoleum provides the comfort as well as the look of luxury—even on unyielding concrete floors. Correctly laid, its resilient character acts as a subtle cushion against shock and jar. Busy feet appreciate linoleum's ease of tread and quietness as much as wise heads applaud its economy and decorative scope.

PLAN FOR LINOLEUM

33

Because there was a need for it

De La Rue have produced a boiler designed from the very first for oil — the Potterton oil-fired boiler which achieves a true working efficiency of 78% of the heat from the oil transferred to the water. This boiler is available in a range of outputs from 108,000 B.T.U. to 288,000 B.T.U. and will be supplied as complete units with fully automatic oil-burners and fitted controls—thus combining optimum performance with minimum fixing costs.

POTTERTON *Oil-Fired* **BOILERS**

POTTERTON OIL-FIRED BOILERS DE LA RUE

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DLR 455

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Dunlopillo

is the best cushioning

you can specify

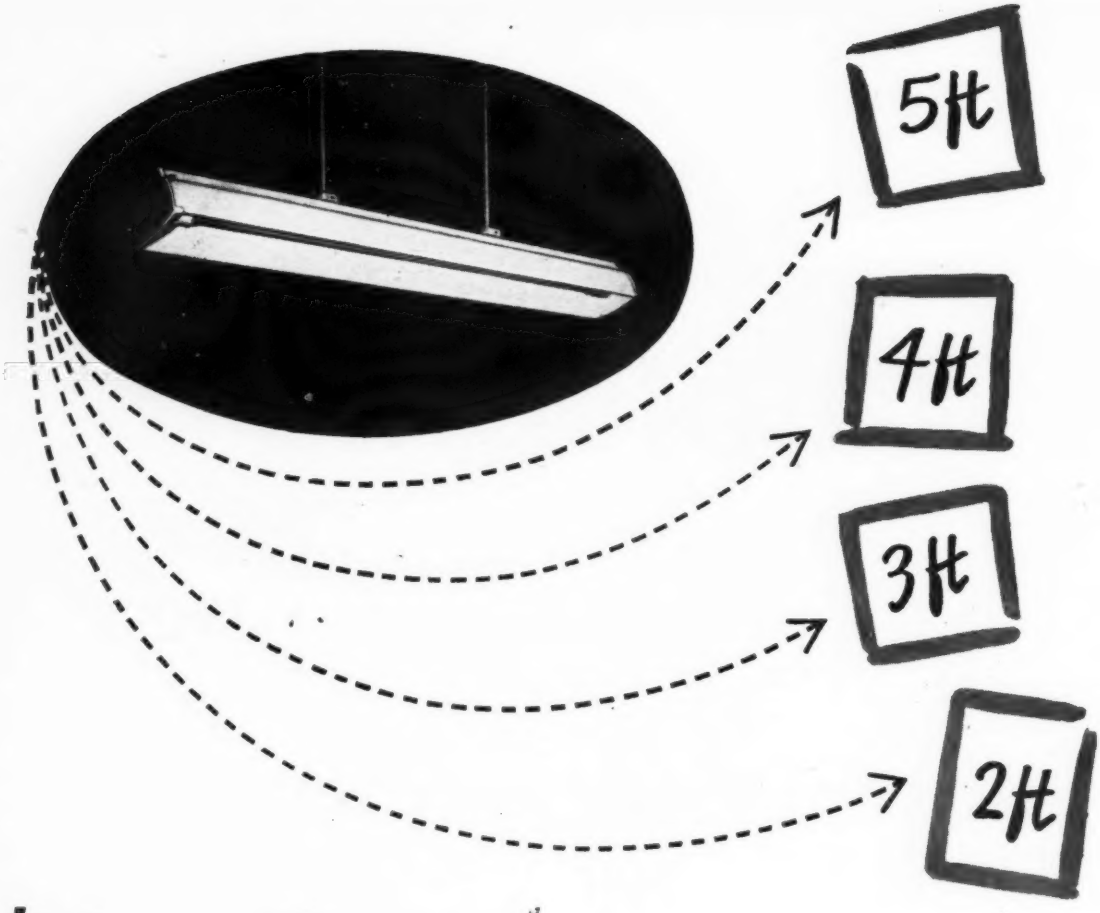
★ It is *consistently* of the highest standard

★ It is backed by unrivalled research and technical facilities always available to you

★ It is the only latex foam cushioning backed by over 25 years manufacturing experience

★ It is unaffected by climatic conditions

★ It is long lasting and economical



'New-Range' is now a wider range

The Crompton 'New-Range' industrial lighting fittings —so universally successful in 5 ft. designs— have now been extended to cover 4 ft. 40w., 3 ft. 30w., 2 ft. 20w. and 2 ft. 40w. sizes.

There are over 150 fittings (1 and 2-lamp) to meet different tasks and give you the benefits of 'New-Range' quality, appearance, standardisation and low cost of installation and maintenance throughout your factory.

The same standardised equipment can be used for either GENERAL or LOCAL lighting, cutting maintenance spares to a minimum of cost and space. 'Permawhite' corrosion-resistant finish, at no extra cost, is the standard treatment for all enamelled metal surfaces but porcelain enamel or 'Perspex' reflectors are also available for many of the fittings. Louvres may be used with all sizes.

Technical service and descriptive literature is at your disposal on enquiry at any Crompton Parkinson office.

BY APPOINTMENT TO HER MAJESTY THE QUEEN MANUFACTURERS OF ELECTRIC LAMPS

Crompton 'NEW-RANGE'

Lighting Fittings for Industry

ELECTRICAL EQUIPMENT

CROMPTON PARKINSON LTD., CROMPTON HOUSE ALDWYCH, LONDON, W.C.2. TELEPHONE: CHANCERY 3333

Meet Mesdemoiselles Potter, Pettigrew, Jones and Unwin

They are what is known as a pool. Not one of those peaceful pools that encourage deep reflection and concentration: contrariwise. While May Potter is pounding out a report on her noiseless, Sheila Jones is telling Mavis Pettigrew about last night, while Phyllis Unwin is carrying on with difficulty a telephone conversation about an important client who's lost in the lift or somewhere. If only a girl could *hear*. Shut up, Sheila, do!

No, no, Miss Unwin! Don't blame Sheila, blame the architect who forgot Fibreglass sound absorption when he designed the tower of babble in which you work. This easily-installed, everlasting material will enhance concentration, save time lost in repetition, reduce errors and improve tempers out of all proportion to its modest cost.

wrap that office in FIBREGLASS TRADE MARK

FIBREGLASS LIMITED, RAVENHEAD, ST. HELENS, LANCS. (ST. HELENS 4224). FACTORIES AT ST. HELENS, LANCS. AND POSSILPARK, GLASGOW.

the unique features of

ROBERTSON Q-DECK

TRADE MARK

include...

The neat and pleasing appearance of the flat ceiling obtained with Robertson Q-DECK, sections QDA2 and QDC, can be appreciated from the illustration. More flat soffit Q-DECK pictures are shown on pages five, ten and eleven of Robertson Q-Deck Publication QD3. *Have you had your copy?*

2... A FLAT CLEAN SOFFIT

- ✓ **flat, clean soffit**
- ✓ **permissible span up to 14 feet**
- **minimised fire risk**
- **resistance to corrosive conditions**
- **'top-speed' fixing**
- **no blistering of felt weatherproofing**

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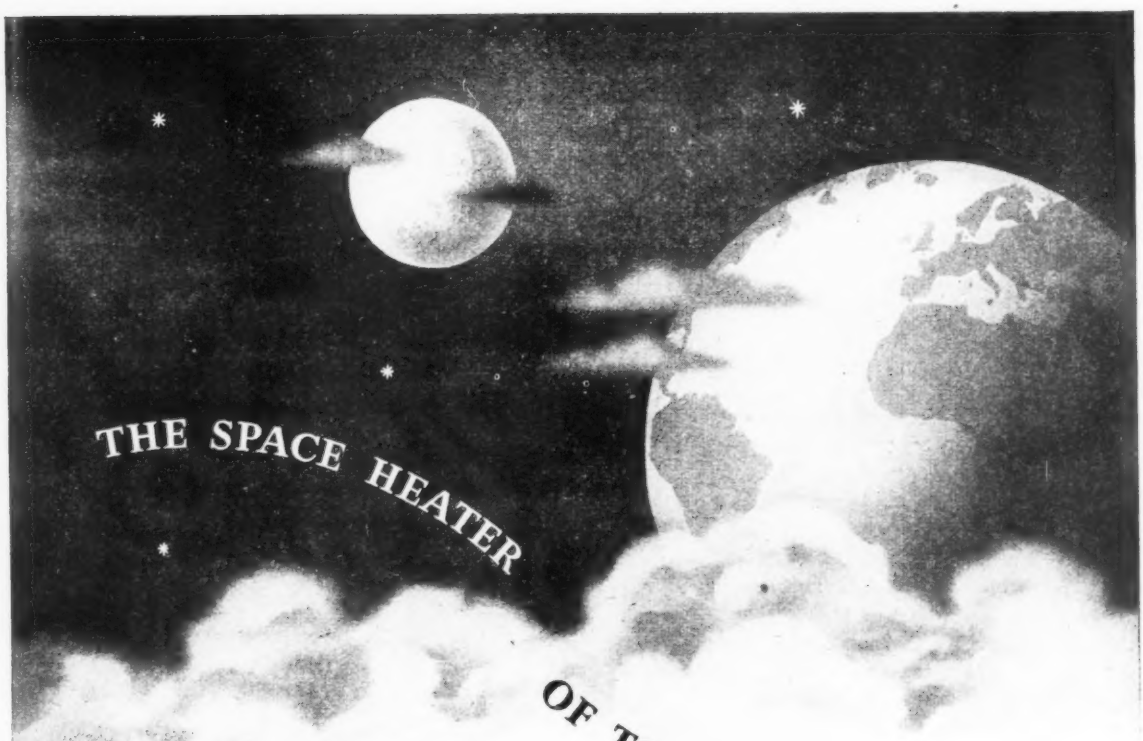
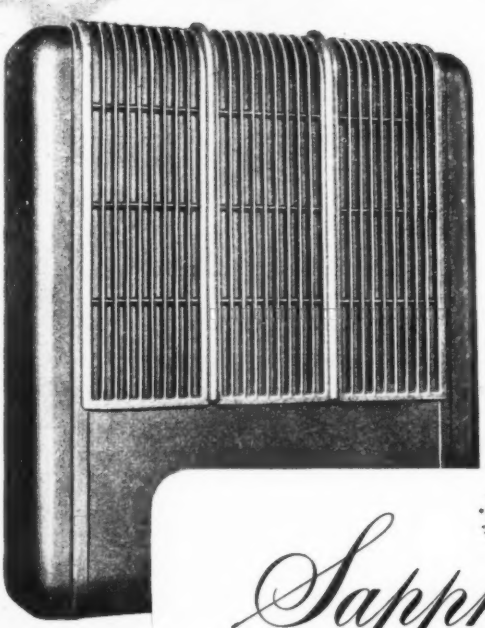


THE SPACE HEATER OF TOMORROW . . .



The Sapphire '20' Balanced Flue Gas Space Heater is the result of British scientific research and development in the field of gas utilization.
Here is the complete answer to modern requirements of maximum efficiency; warm, fresh air, unpolluted by products of combustion, *plus* the highest possible safety factor.

Sapphire "20"
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Service to Architects by

BENHAM

This well-known West End restaurant in Jermyn Street caters for the epicure and uses Benham Cooking Equipment. The restaurant was one of the first to be equipped since the war with the gas underfired silver grill (extreme right of lower picture). The wall range is a 7-unit gas "Solid-top"; the pot rack over has two hot closets as well as a salamander incorporated.

Kitchen planning. Manufacturers of cooking apparatus —all fuels. Manufacturers of sinks, drainers, tables, etc., in timber and stainless steel. Kitchen ventilation, including hoods and ductwork.
All hot water and/or steam services, etc.

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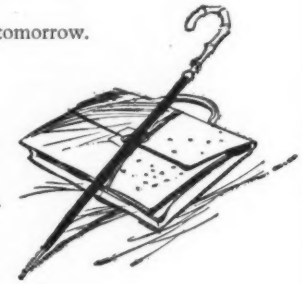
On the dearth of Immortals

"O, King, live for ever!" the people cry. But under present imperfect arrangements even kings never quite manage to bring this off. The people's chances aren't too bright, either. Crown and sceptre, umbrella and briefcase, all have to be laid aside in time. The analogy is not exact. National revenues, after all, go on. Private revenues are apt to dwindle and stop . . . Unless the breadwinner pauses in his breadwinning to think: to think ahead to the day when, incredibly but inevitably, someone else will be going through the papers in his writing desk, his deed box, his office drawer marked "Private". To find what? With luck, a safeguard for the years to come. An assurance not only of capital today, but income tomorrow.

But seriously and urgently—

The SAFEGUARD POLICY means continuing security for your dependants when you are no longer on hand to see to it. It means material comfort for them in the future; spiritual comfort for you in the present. And all for a small additional premium to either Endowment or Whole Life Assurance.

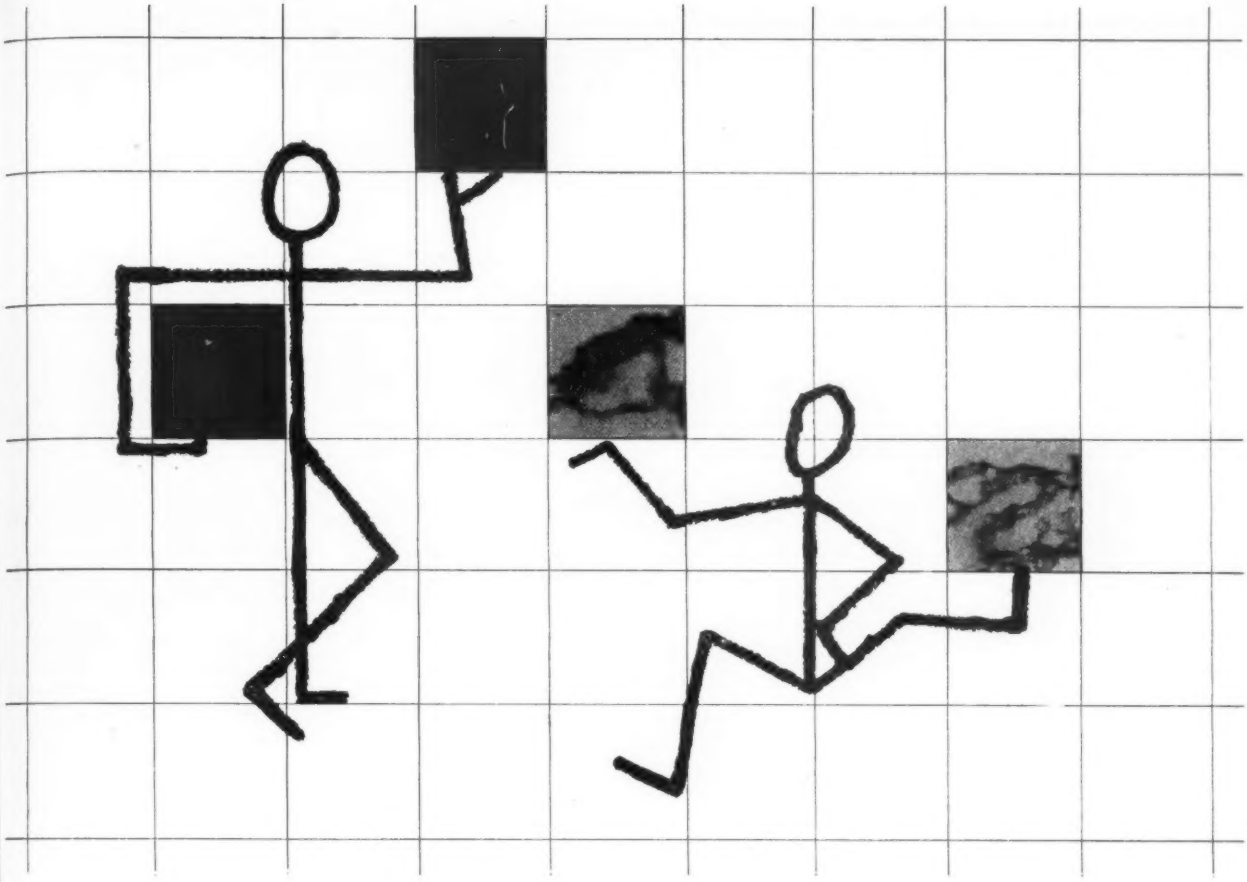


Full particulars, with illustrations of how the SAFEGUARD POLICY *works, may be had, in exchange for the date of your birth, from*

LEGAL & GENERAL

ASSURANCE SOCIETY LIMITED

CHIEF ADMINISTRATION: 188 FLEET STREET, LONDON, E.C.4



New ideas in tiles and tiling come constantly from Carters. One of the latest is brush line decoration on plain white or self-coloured tiles with a contrasting coloured enamel tile here and there. Nothing can permanently brighten a dull corner so inexpensively. And Carter-fixed it will look, as always, a truly quality job.

Registered Trade Mark

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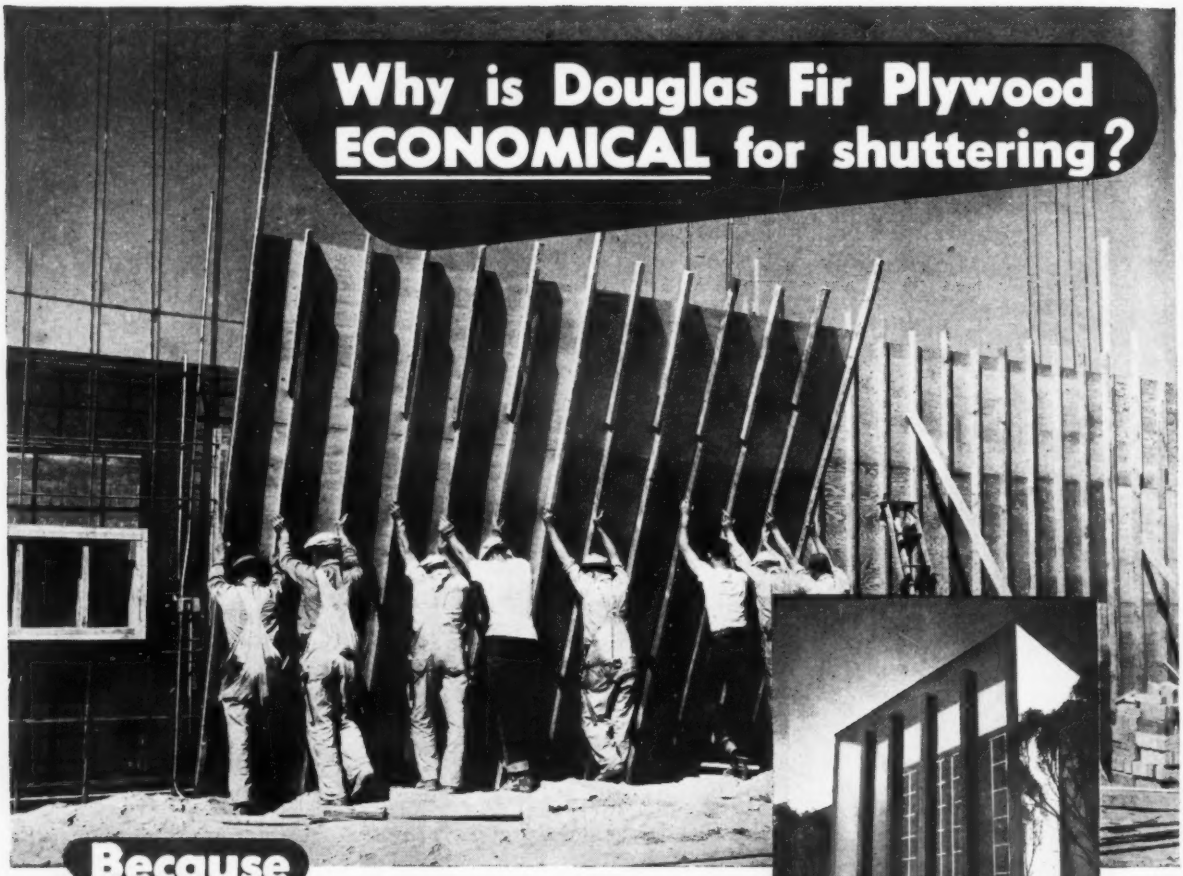
Why is Douglas Fir Plywood ECONOMICAL for shuttering?



Because . . .

Douglas fir plywood is less in cost than other plywoods available and suitable for shuttering.

Because Douglas fir plywood has an unique combination of properties which are fully utilized when forming concrete. The large smooth panels are easily handled. Thirty-two square-foot panels mean fewer joins, less cutting and minimum waste . . . qualities which produce real savings in time and labour. Concrete poured in Douglas fir plywood forms requires very little finishing because ridge and join marks are greatly reduced. Permanent plywood forms can be quickly and easily cleaned, stored and transported—and with reasonable care, may be re-used 40 times or more.

Worth investigating!

. . . the new economy grade plywood that is priced to reduce the cost of concrete work by pounds !—Ask your usual supplier about DOUGLAS FIR UNDERLAY SHEATHING. (Many other grades available.)

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DOUGLAS FIR PLYWOOD CONCRETE FORM WORK

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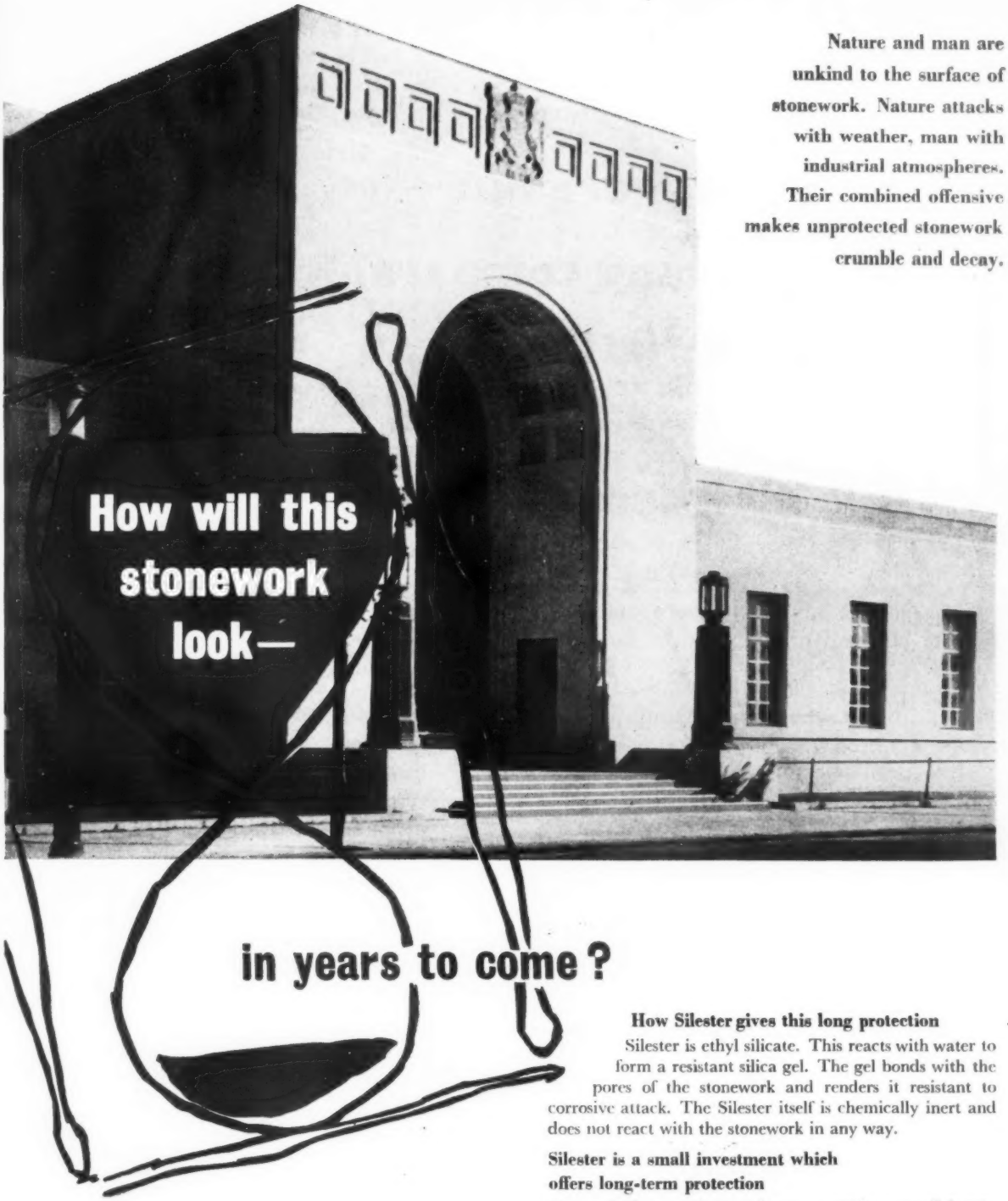

Nature and man are unkind to the surface of stonework. Nature attacks with weather, man with industrial atmospheres. Their combined offensive makes unprotected stonework crumble and decay.

Monsanto Silester* is the surest safeguard

Silester has been developed to protect stonework, both old and new. Old and crumbling surfaces are restored by trimming back to good stone and dressing with Silester. New stonework can be made proof against the worst nature can do, proof against man-made acids, dilute alkalies, most salts and vegetable oils.

How Silester gives this long protection

Silester is ethyl silicate. This reacts with water to form a resistant silica gel. The gel bonds with the pores of the stonework and renders it resistant to corrosive attack. The Silester itself is chemically inert and does not react with the stonework in any way.

Silester is a small investment which offers long-term protection

Economical to purchase and easy to apply, a small investment in Silester will ensure that your stonework is well preserved after many years of exposure — and it makes the cleaning of exterior stonework a much simpler task.

Write for full information to (**Registered Trade Mark*)

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304 Victoria Station House, Victoria Street, London, S.W.1.

In association with: Monsanto Chemical Company, St. Louis, U.S.A. Monsanto Canada Ltd., Montreal. Monsanto Chemicals (Australia) Ltd., Melbourne. Monsanto Chemicals of India Ltd. Bombay. Representatives in the world's principal cities.

MONSANTO
Regd.

Q Which plastic surfaced sheet gives more but costs less than any comparable material?

A Klingdecor - the demand increases daily!

For homes & industry,
hotels & restaurants,
schools & hospitals,
stores & shops

On walls, doors, shelves, bathroom panelling, working surfaces, bar tops, serving tops, table tops, desk tops, storage fitments, laboratory benches, and counters

More heat resisting

Klingdecor is unharmed by temperatures up to 320°F . . . well above the boiling point of water.

Fully cigarette proof

Every inch of Klingdecor is fully cigarette proof — at no extra cost.

Costs less than any comparable material.

KLINGDECOR

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Another KLINGER Product

Manufactured by Richard Klinger Ltd., Klingerit Works, Sidcup, Kent

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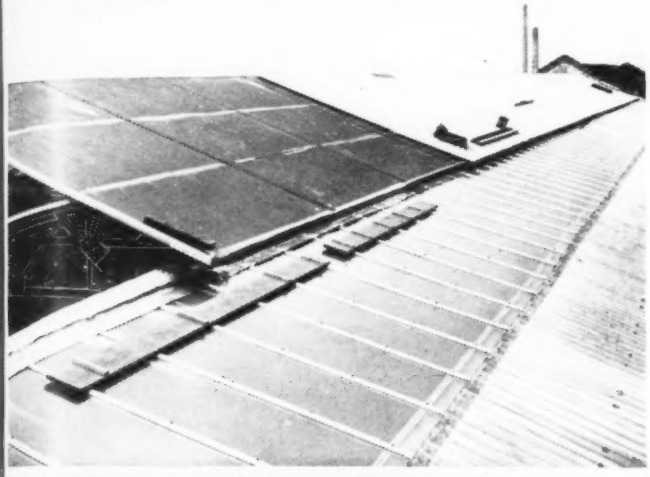

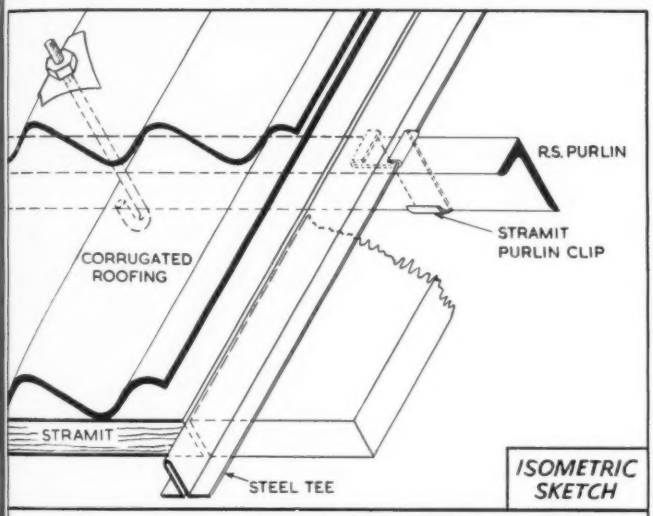

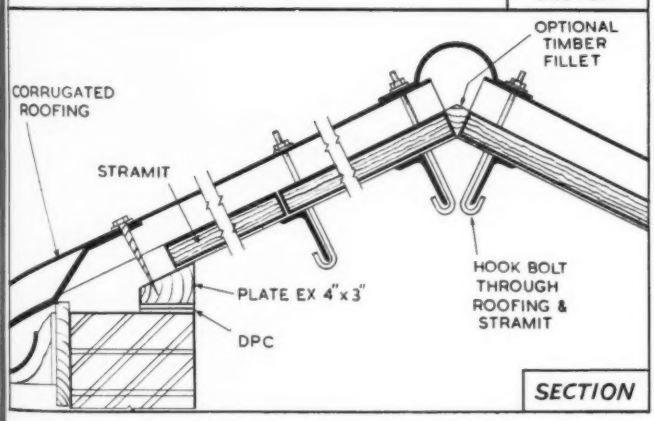

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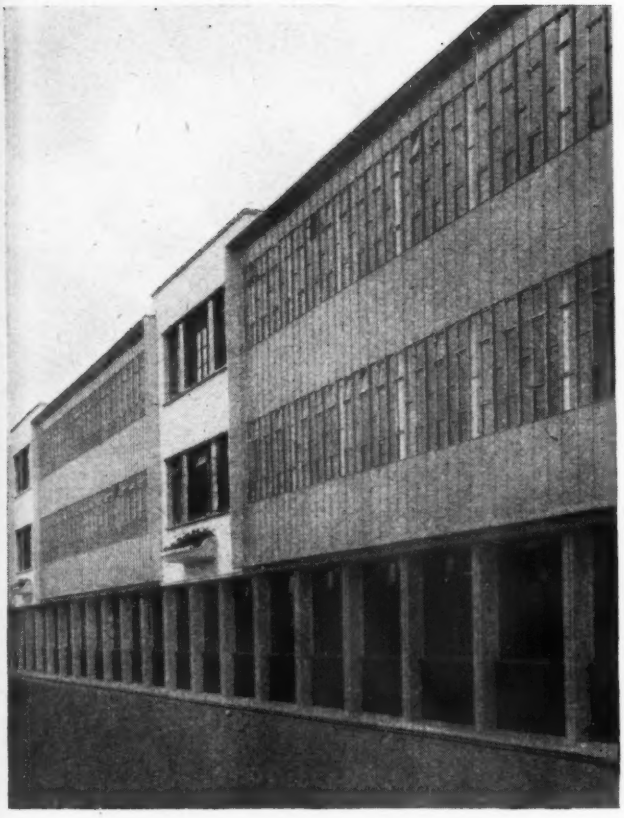

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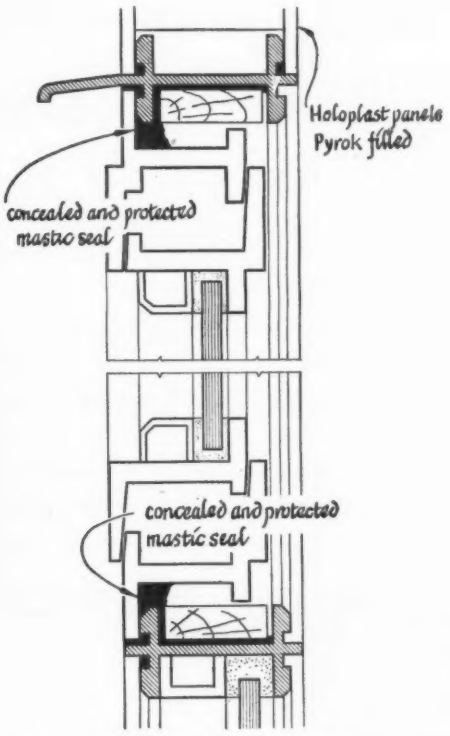

Typical vertical section showing use of specially designed aluminium sections

In the cladding of framed buildings

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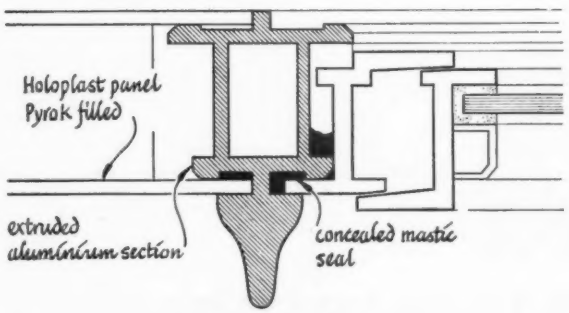

Typical sectional plan

An important problem common to all techniques for cladding framed buildings is that of providing an effective and lasting waterproof barrier at the joints.

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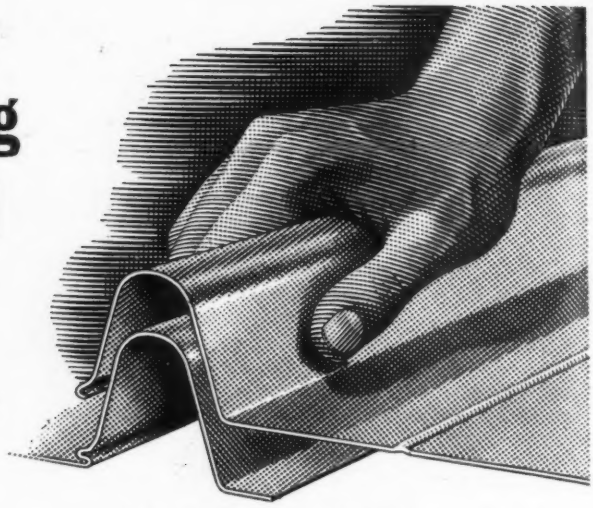

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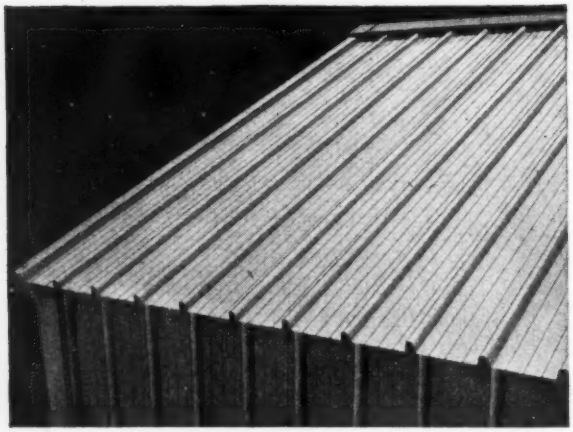

Roof and walls are good-looking and weatherproof.

'Snaprib' can be used for roofing houses—traditional or prefabricated—or for siding and roofing industrial buildings. It can be fixed on metal or timber purlins, and insulation boards can be incorporated. It comes in lengths up to 20 ft., so that end-laps can often be avoided altogether. Where necessary, it can readily be dismantled without damage and used again on another installation.

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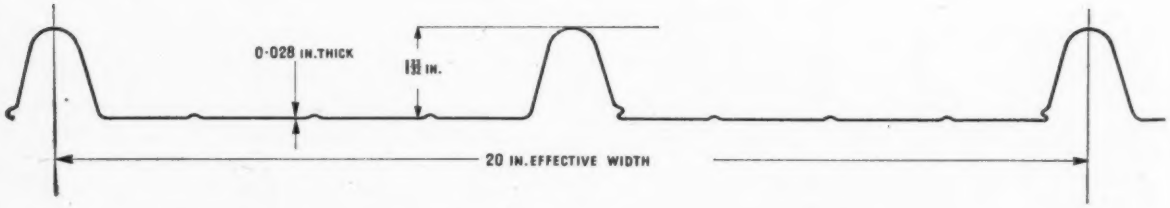

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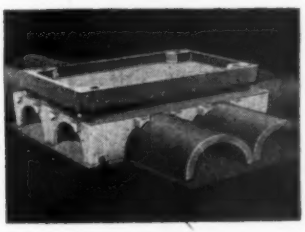

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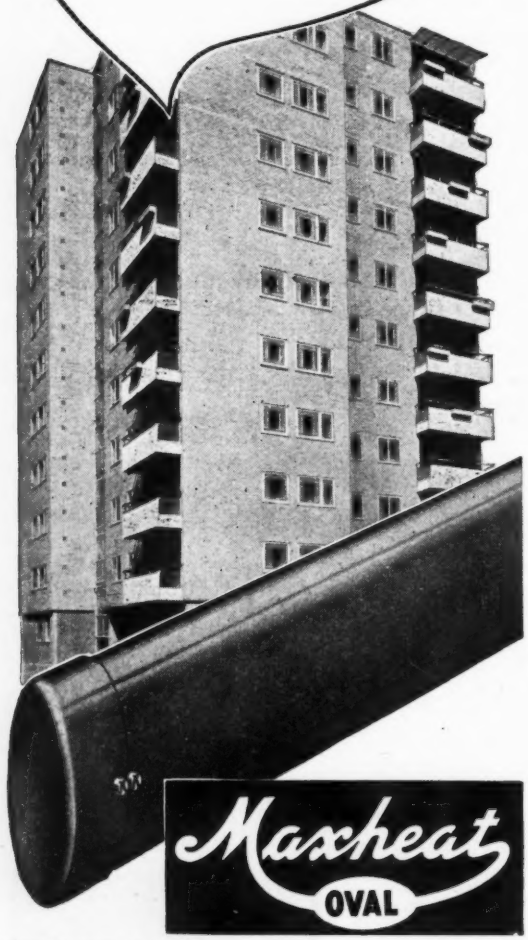

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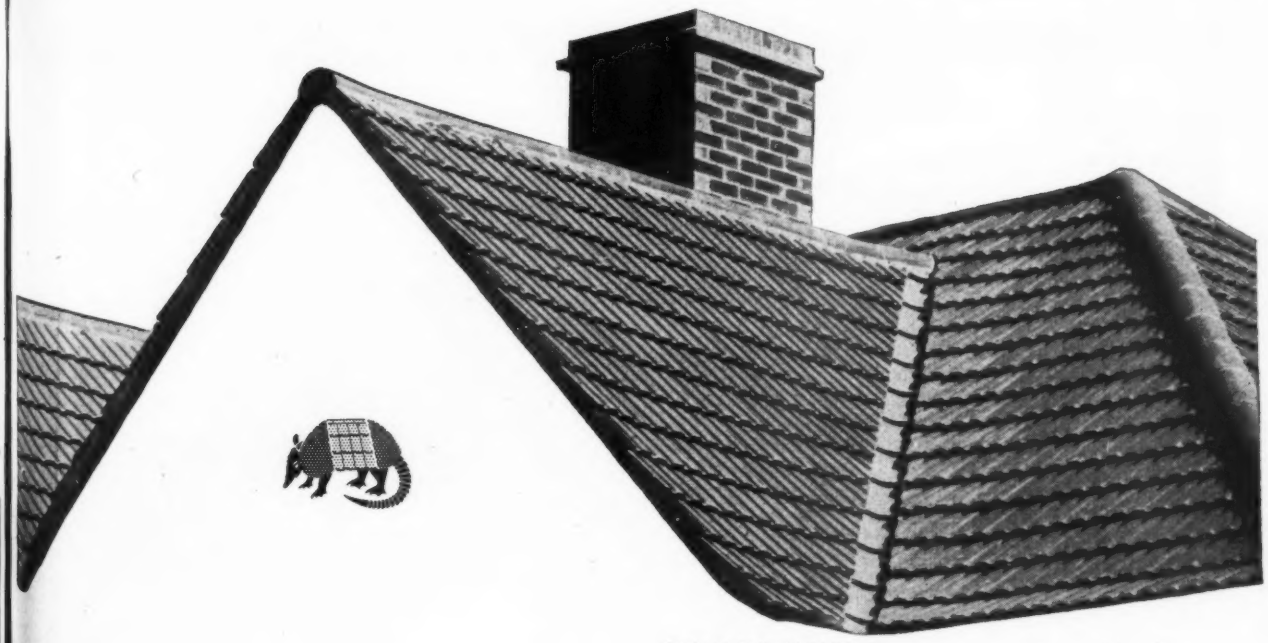

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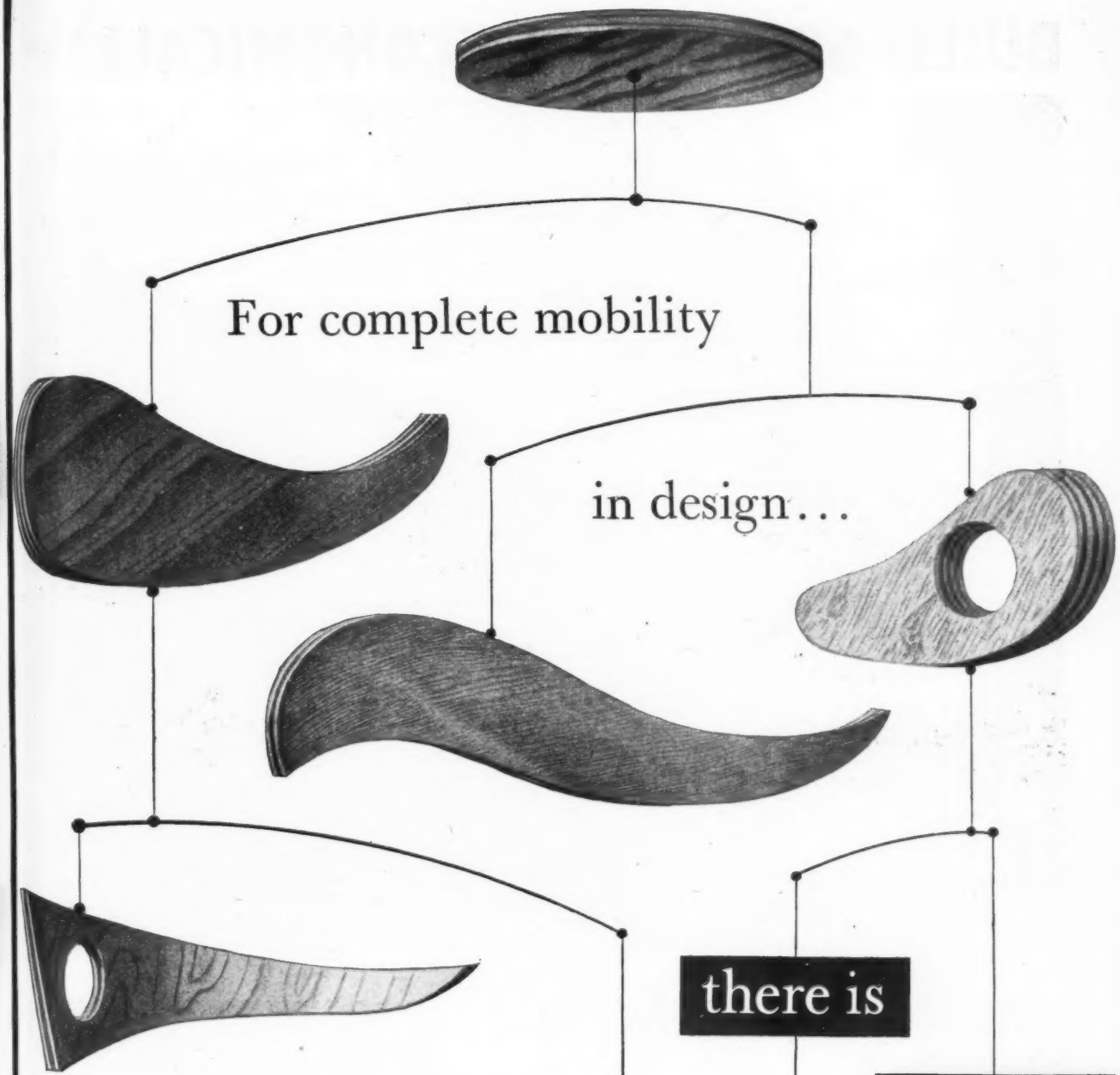

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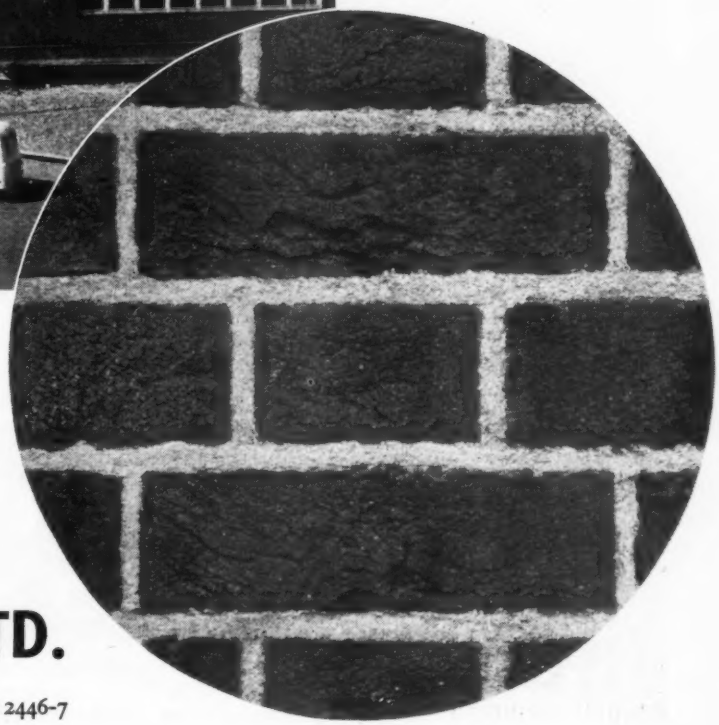

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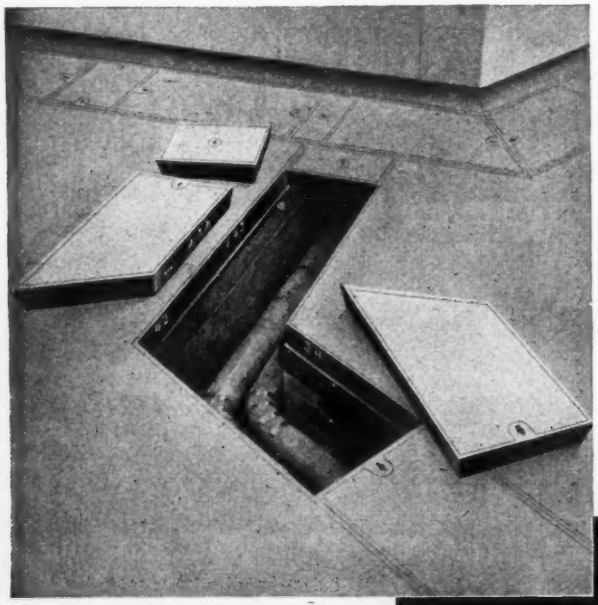

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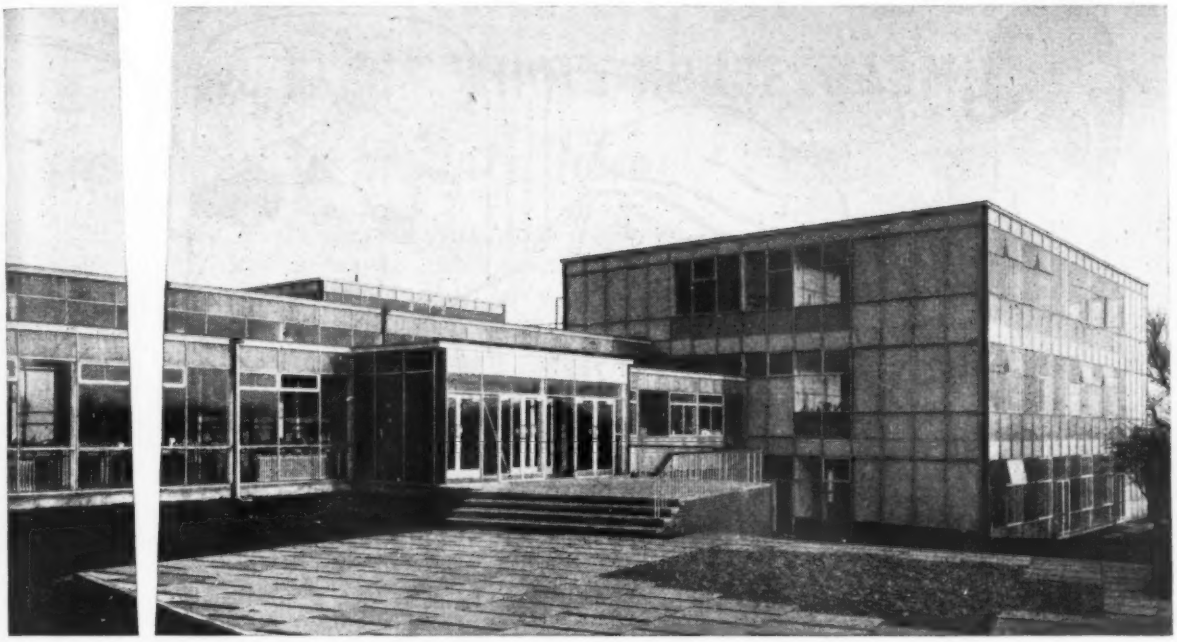

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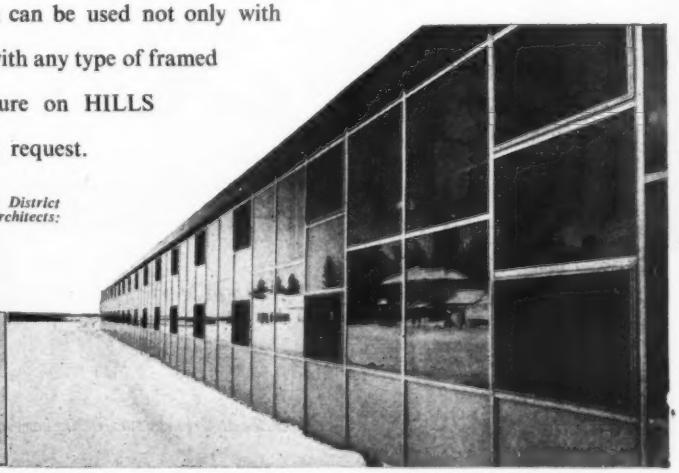
(Illustrated at top.) Hurlfield Secondary Modern School for Girls, Sheffield. Architects Co-Partnership in collaboration with J. L Womersley, A.R.I.B.A., A.M.T.P.I., City Architect.

(Right). The Wingham District High School, Toronto. Architects: Messrs. Kyles & Kyles.



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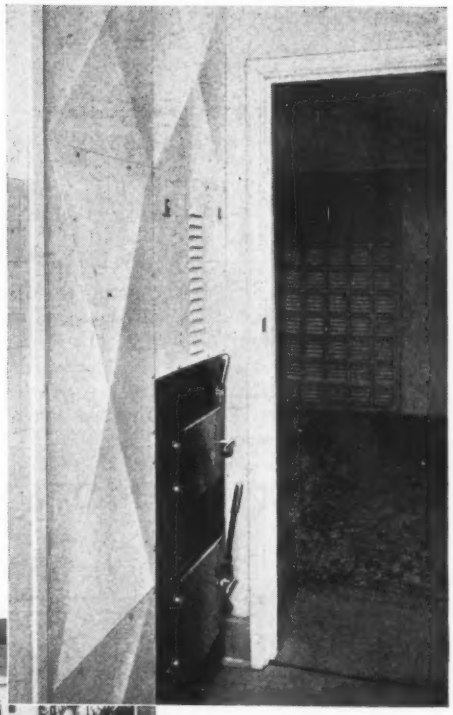

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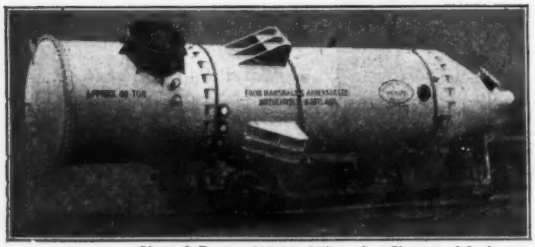

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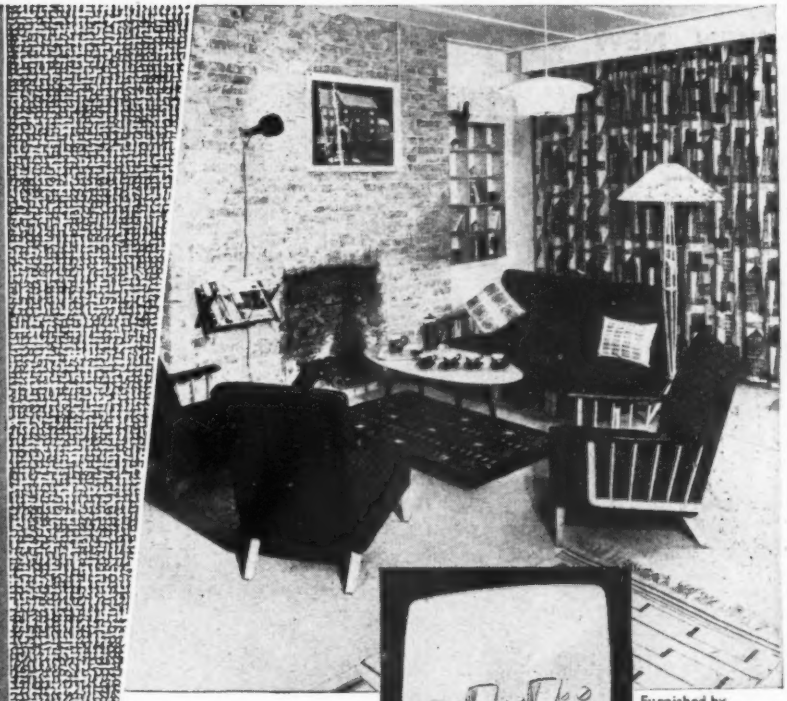

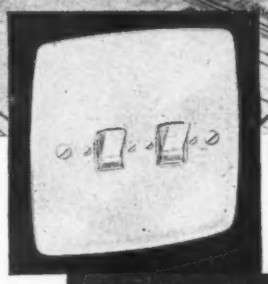

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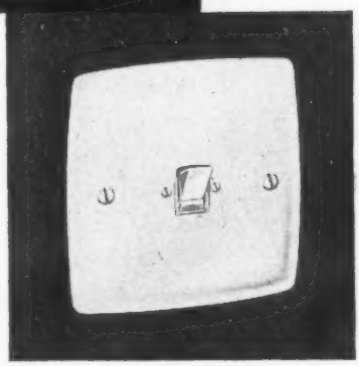

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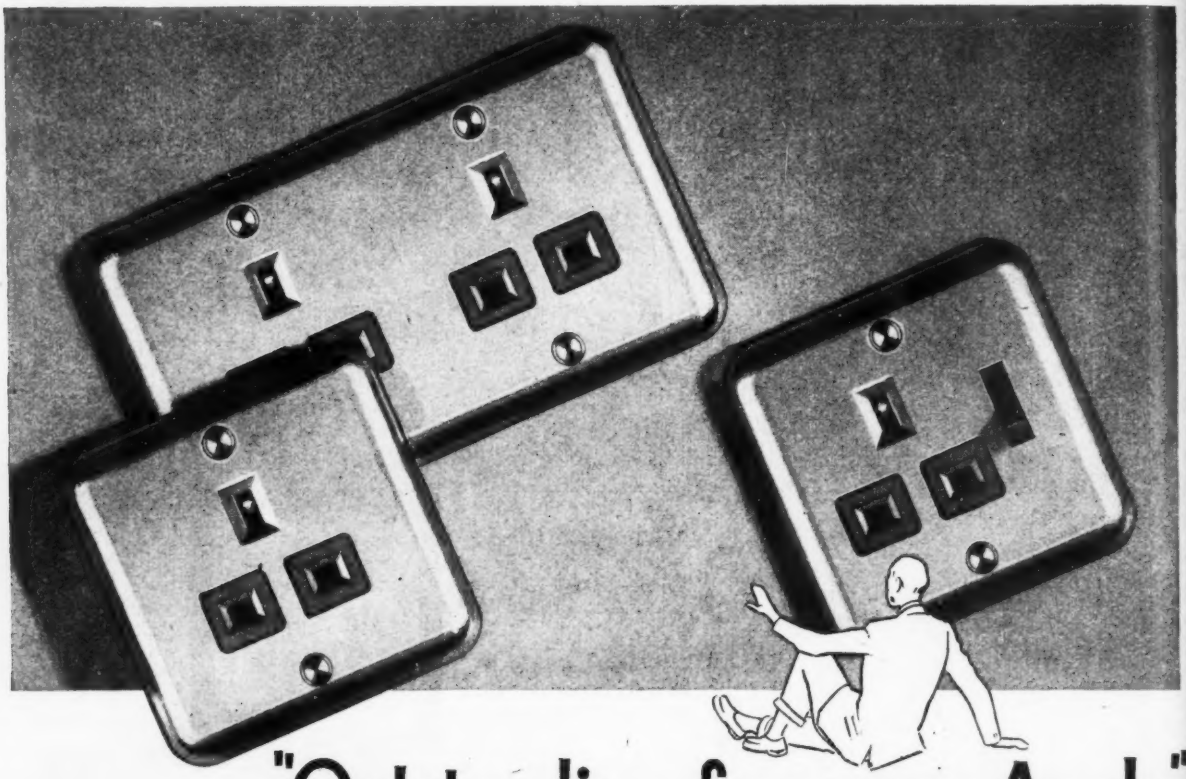

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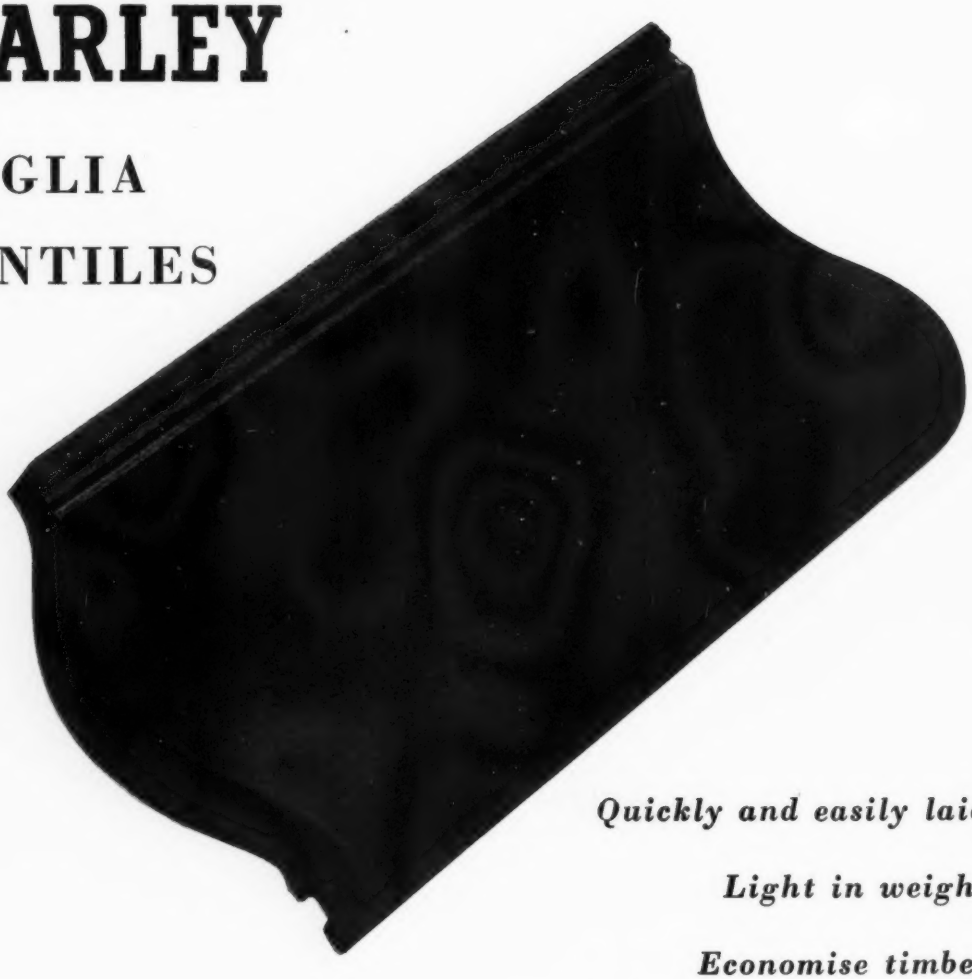

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No. 3163 October 13, 1955 VOL. 122

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DO YOU KNOW WHAT YOU SHOULD KNOW?

Several architects have commented to ASTRAGAL in congratulatory terms on the idea of having a JOURNAL Research Fellowship. The President of the AA, Bryan Westwood, has very kindly taken the trouble to write his approval —see page 482. No doubt similar approval will be given by the profession to the Research Board's choice of subject for the first Fellowship: "Information for the architect: what does he need and where will it come from." (The Board's full statement appears on page 483.) This is an obvious and essential first subject. As specialization grows and grows, and architects and research workers learn more and more about less and less, it is salutary for an experienced architect to be given time to look at the programme of research, and the documentation of it, as a whole. To try to obtain what is nowadays called a "global" picture of what the architect needs to know and what his sources of information are.

*

It would seem pretty obvious that anyone who can spare the time to spend nine months or so sorting out the present muddled situation as regards the intake and output of technical information will have rendered himself and the profession a great service.

JOURNAL FOR MASTER BUILDERS

ASTRAGAL welcomes a new architectural columnist, "Frog"—even though his view of architecture seems currently restricted to plasterer's work and plumbing—and the new magazine, *The Master Builder's Journal, in which* he appears. The Federation of Master Builders and the Master Builders' Federation have hitherto had local journals, but no national organ to put their viewpoint over, and although neither organization has been exactly inarticulate, a regular monthly marshalling of their views and their interests in print will serve a useful function for other sectors of the building industry besides their own.

FOR CLOCK-WATCHERS ONLY

Anyone who didn't go to Goldsmiths Hall the other day to see the Timekeeping Exhibition missed a most excellent historical show. Admittedly there is something faintly tiresome about clocks which play tunes or imitate waterfalls—a typical present for the sort of Empress who probably can't tell the time anyway, but the bracket clocks and early watches on view were magnificent, and "Longitude" Harrison's second chronometer watch (the three early monsters and the first watch are at Greenwich) could well serve as a model of restraint for today. The historical part of the exhibition was intended as a lead-in to the show of current work, but it made today's efforts seem ludicrous. Chronometer makers, thank goodness, still go on in the traditional way, but apart from their work there were barely half a dozen tolerable designs in the show.

JOLLY HOTELS

I have good news for those of my readers who have not long returned from their holiday with the kiddies at Walberswick and are planning to recover in the more remote parts of Italy—the deep south, the east coast, Sicily and Sardinia and other spots where the 1913 Baedeker warns off the ladies. You may now reside there, apparently, in modest comfort in surroundings not unworthy of Italy's present architectural renaissance. The chain of Hotels Jolly are worth knowing about; they are well planned and well decorated, and they give good food at fair prices. They are also, perhaps, part of the answer to recent comments on the difficulties of English hoteliers. Even the ubiquitous Mr. Hilton finds England a bad risk compared with Istanbul. At the Jolly Hotels (there are over forty of them) you may have only a small bedroom, but there is everything in it. Its apparent smallness and real luxury are easily explained—careful design, good colour and first-class state-room fittings. For a night or even a week what more do you want. Trust Houses please note!

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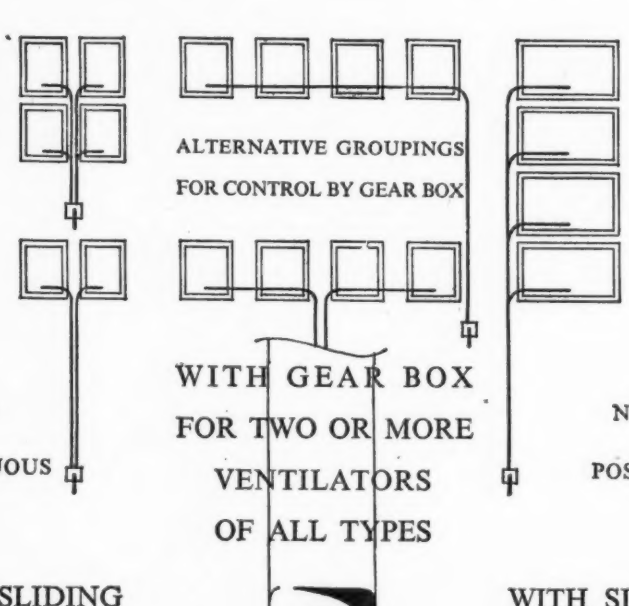

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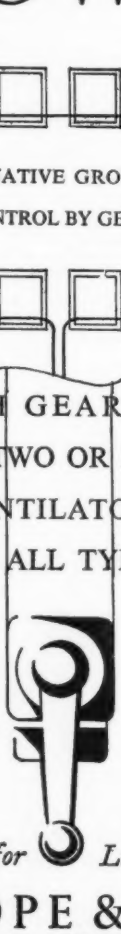

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AT HOME AND ABROAD

My three photos this week show three new buildings that the US Foreign Buildings Operations has recently put up in different parts of Europe as embassy offices and staff living quarters. They are illustrated in this month's *Architectural Review* and invite comparison with the sort of thing the British Government puts up for its officials abroad.

*

A year or two ago such a comparison would simply have made the Britisher despair, so retrograde in every way were the buildings by which foreigners had to judge contemporary British architecture (not excluding official foreign visitors to Britain—look, if you can do so without wincing, at the British Council headquarters in Davies Street). But lately there have been signs of improvement; witness the new British High Commissioner's residence at Colombo and the trouble the MOW took over furnishing it.

*

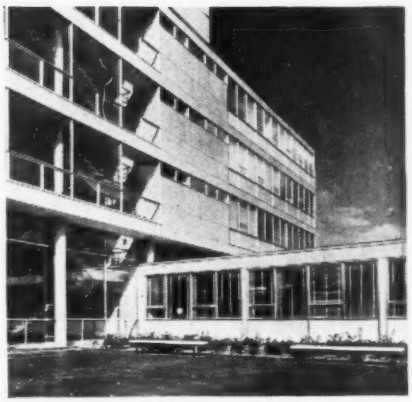
But there is room for much more progress, and a bolder policy still. What is happening, for example, about the proposed block of embassy offices in Washington, which at one time it was seriously intended to build in a watered-down version of the style Lutyens used for the embassy proper? Such buildings are a mirror in which the vitality (or otherwise) of British design is all too clearly reflected.

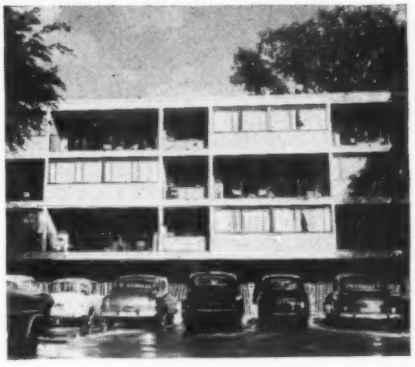
FIRST FIND YOUR EXHIBITION

At the Victoria and Albert's comprehensive memorial show of McKnight Kauffer's work, the exhibits range from full-size billboard posters for Shell to book-illustrations and luggage stickers. As ASTRAGAL went round, with growing admiration for this pioneer of better commercial design in England, he became more and more acutely aware that the England in which Kauffer pioneered is deader than any number of Dodos.

*

Alas for those departed days of unsophisticated innocence when Fine Art was an effective advertising gimmick, and enlightened publicity still seemed a workable way of taking art to the people. Now that the so-called Communication Industry has grown up, and evolved its own art-forms that are so slick, so cunning and so punchy, Fine





Above: US embassy offices, Stockholm. Above right: apartments for the staff of the US Paris embassy, Neuilly-sur-Seine. Right: US embassy offices, Copenhagen (see note on the left). All these are by Rapson and van der Meulen, working under the direction of the regional director of the USFBO. (Ides van der Gracht in the case of the first two buildings and Alan B. Jacobs in the case of the third.)

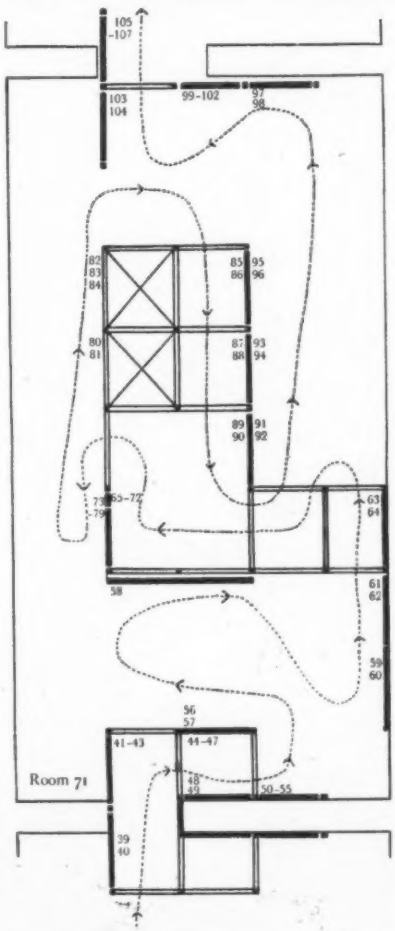
Art has been pushed back in its ivory tower with the other long-hair pastimes. The advertisers, stylists, package-designers and magazine layout men can get along quite nicely thank-you without any assistance from the Kauffers of this world. Even if one had already become dimly aware of this changed state of affairs, this exhibition will punch the point home in a way that hurts; the days when the Fine Arts could lead the Popular Arts are gone with the other dreams of the hopeful Thirties, and several bodies of opinion—including architects—should now start adjusting themselves to a brassy new world.

*

A word about the exhibition layout by Ian Bradbery. Now that the space-frame/labyrinth type of layout has been pushed to the point where the exhibition can't be followed without a sort of Victor Silvester dance-diagram (see my illustration), isn't it time to go back to the beginning and start again, with the assumption that the aim of an exhibition is to *show the exhibits to the visitors*?

RESTORATION COMEDY

Despite the efforts of the Royal Academy School, the York Architectural Trust and others, there is, apparently, a growing shortage of architects capable of restoring old buildings. There is no shortage of builders, as yet. No doubt many a plasterer is glad to restore a few yards



Not one of Victor Silvester's dance routines, but a guide to exhibition-viewing. See ASTRAGAL's *note in first column.*

The AJ Research Board

As announced in the JOURNAL of September 29 a Board has been appointed by the Editors to govern and administer the award of an annual research fellowship. It is intended that the research should be particularly concerned with the organization of existing knowledge for practical application by architects. The Board has now met, and its first statement, which gives the subject for study for the first AJ Research Fellowship, the value of the award, and the conditions of study are given on page 483. This statement is commented on in the leading article opposite. The members of the Board are shown, above, at their inaugural meeting in the JOURNAL's offices in Queen Anne's Gate. Reading clockwise, the members are: S. A. W. Johnson-Marshall, Chief Architect of the Ministry of Education; Michael Pattrick, Principal of the Architectural Association School of Architecture; W. A. Henderson, architect in private practice; W. A. Allen, Superintending Architect at the Building Research Station; Richard Llewelyn Davies, Director of the Division for Architectural Studies of the Nuffield Foundation; Anthony Pott, Principal Architect in charge of the Development Group of the Ministry of Education; Robert Gardner-Medwin, Professor of Architecture, Liverpool University, and C. C. Handisyde, architect in private practice. Also attending, but not shown, were Robert H. Matthew, Professor of Architecture, Edinburgh University; and the *ex-officio* members, the Executive and Technical Editors of the JOURNAL.

of elaborate cornice after a few miles of local-authority ceilings. But the shortage of architects is such that the MOW, as announced recently, are presenting an exhibition at the RIBA in December on the whole problem of restoration in the hope of interesting both the profession and the general public. As the Historic Buildings Council has about a quarter of a million pounds to spend each year on repair and preservation, the Ministry is simply anxious to ensure that there are sufficient competent architects to cope with the spending of it. So, if the modern world ignores, shames or frightens you, and you can remember the orders, here is a little niche in the past you can carve for yourself.

IMPOUNDING CARS

For dealing with the menace of stupid parking, the Paris police are now provided with mobile cranes for loading the offending car on to a lorry and taking it away, the owner having to pay a fine to redeem it. This revival of the old habit of impounding stray animals seems an excellent idea as, even if the owner is rich enough not to mind the fine, he still has the nuisance of being suddenly carless and having to waste time fetching it and (if the Paris police are still what they used to be) having to submit to a rather humiliating lecture.

BY AP OUT OF AJ

ASTRAGAL was once the junior nurse amongst a host of anxious fast-moving midwives and obstetricians engaged in delivering an endearing little guide named "London Night and Day."* Few know the agonies the midwives went through—the parent body suffered enough, in enduring virtually a caesarean section to produce a pocket edition from the upright form on which I write. But the parturition was successful, and this guide is now entering its fourth edition.

*

The baby, once more brought up to date, remains in ASTRAGAL'S estimation the most useful guide to London obtainable. Its value to the provincial up in London for a week—and determined to have something not to tell his family about—is only surpassed by its importance to the Londoner anxious to show provincials that he knows his way around.

* Edited by Sam Lambert. The Architectural Press. 5s. 0d.

ASTRAGAL

POINTS FROM THIS ISSUE

More about the **AJ Research Fellowship** .. pages 477, 480 and 483

The first three-storey aluminium school .. .. .. page 485

Comprehensive secondary **school at Coventry** .. .. page 487

Programming an architect's work .. .. page 503

The Editors

INFORMATION FOR THE ARCHITECT

ON another page in this issue we announce that the first Fellowship to be awarded by the JOURNAL'S Research Board is to be devoted to "information for the architect." This is not a research project in the strict sense of the word but something in the nature of a survey. It will map out the field in which the Board has to work: it will provide a preliminary estimate, which will be as detailed as time will allow, of the service the Board will perform for architects through the years.

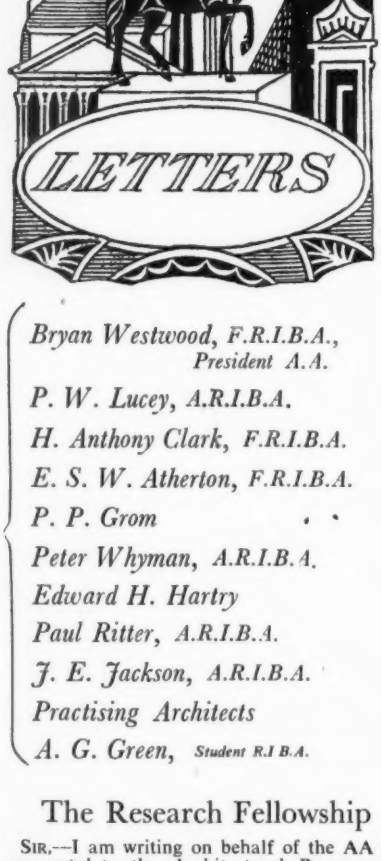
A useful by-product of such a survey will surely be a bibliography for the office library: a "*catalogue raisonnée*" of the publications the architect must have within reach and must be in the habit of consulting. This is a long-felt and very urgent need in the profession for, granted that no architect can retain, in his head, all the information he needs, an efficient office reference is something near to being an index of professional efficiency. Yet how many architects' offices possess libraries which are at all sufficient, which really "work"—and which, in consequence, are really used?

The architect cannot get *all* the information he needs from existing publications, for there is a whole literature, an *architect's* literature, still waiting to be written. The main objective of this survey, therefore, will be to show how and where the architect's sources of information are defective. Defective not only because the information is not available, but because it is locked up in specialists' publications.

It is a familiar experience these days for young architects, who set out on their professional careers determined to use published information to the utmost, to spend long hours chasing the simple facts only to be forced to give it up as a bad job. There must be many at this moment who have had enough experience to know what is wanted, but not enough to be cowed by the inherent difficulty of doing something about it, and who will have said to themselves time and again, "if only I could have enough time off to do this I could make some order out of this jungle."

Now, at long last, one of them can try his hand. He will be supported by the resources of the JOURNAL and the advice and help of an influential Board of architects.

This statement is commented on in the leading article opposite. The members of the Board are shown, above, at their inaugural meeting in the JOURNAL'S offices in Queen Anne's Gate. Reading clockwise, the members are: S. A. W. Johnson-Marshall, Chief Liverpool University, and C. C. Handisyde, architect in private practice. Also attending, but not shown, were Robert H. Matthew, Professor of Architecture, Edinburgh University; and the *ex-officio* members, the Executive and Technical Editors of the JOURNAL.



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The Research Fellowship

SIR,—I am writing on behalf of the AA to congratulate the Architectural Press most warmly on taking the initiative in filling the long felt need for post-graduate architectural research.

We do not envy you the task of deciding how to begin and will look forward with great interest to see which facets of the subject are first chosen. We are indeed heartened to see that the scheme is well founded and on a scale which promises valuable results.

BRYAN WESTWOOD.

London.

Poaching : Masterly Inactivity by the RIBA

SIR,—It has become the fashion lately in certain quarters to decry any form of competition, and seldom has this view been more blatantly expressed than recently in your correspondence columns under the heading of, so-called, "Poaching."

What private work a salaried architect does in his spare time, be he in a public or private office, is entirely his own concern, provided that it does not become so arduous that his efficiency in the office is impaired and provided that it is not done during office hours.

If either of these condition is broken, his employer is at perfect liberty to give him the sack. It is because of these conditions that the private work that a salaried architect can undertake is bound to be limited to small works near at hand. This can be no threat to the established private firms with all the advantages they possess of office organization, etc., although it may constitute a little healthy competition. The salaried architect who takes on spare time jobs is doing it primarily to build up a practice, and as soon as he lands a job big enough to require more than spare time attention he sets up an office of his own.

If the RIBA were to ban salaried architects undertaking spare time work, would it not be logical for it, on the same grounds, to restrict participation in architectural competitions to principals in private practice only? No sir: in this case the RIBA is pursuing a sound policy in its masterly inactivity. Long may it continue.

P. W. LUCEY.

London.

....Contemptible Excuses

SIR,—The present-day overworked private architect is not concerned with the financial loss resulting from "poached" commissions, but with the undoubted harm, resulting from this increasingly prevalent practice, which is done to the standing of the profession in the eyes of the general public.

The pitiful, and sometimes dishonest excuses given by official salaried architects who undertake private work in their "spare" time are contemptible.

The vast majority of such offenders have no bona-fide intention of ultimately establishing themselves in private practice. They prefer to enjoy the security, short hours, and easy responsibilities of their employment supplemented by the gleanings of private commissions.

There are several straightforward ways, even without capital, by which architects can hope to achieve their own businesses, but "poaching" is not one of them.

Official architects and assistants who wish to add to their remuneration might consider helping out their brethren, the under-staffed private practitioners, with spare time work. This would leave far less room for suspicion of encroachment upon official duties. But perhaps the knowledge that the extra money so earned would have to be declared for income tax ranks as a deterrent?

H. ANTHONY CLARK.

Wrexham.

....Suburban Victims

SIR,—I have not followed the recent correspondence on the subject of private practice by official architects, but this is a matter which does require urgent attention by the Institute and by the various local and government departments.

Mr. Martindale points at the heart of the whole matter. He says, how can the normal professional standards of supervision and the urgent day to day queries be settled by the architect employed elsewhere? There are two answers to this; either the works are not supervised in a proper manner, or the employee of the local or government department takes time off and does the supervision in the time of his main employment, both of which are undesirable.

From my knowledge of this matter it would appear that a certain amount of supervision is done in the time of the employer, and for this very reason it is possible for these part-time architects to do the work at *cut fees.*

I am informed that in many areas council building inspectors prepare garage plans for as little as £4 4s. and ⅛ in. scale house plans for £12 12s. They are of course being subsidised by the ratepayers.

The architect in the suburbs is in particular a victim of these unfair practices and it is time that the Institute took some effective action thereon.

E. S. W. ATHERTON.

Middlesex.

....Blame Low Salaries

SIR,—The recent demands by salaried architects for a trade union and the private practitioner's complaints of poaching by official architects appear to have common ground—that of the low salaries paid to architects. It appears that the remedy for all those complaints would be to increase salaries and offer more partnerships to salaried architects employed in private practice. Local authorities and companies will not then be able to attract so many architects into their employment, and, consequently, more work would come into private offices.

At present, architectural work in public offices is done for a very small fraction of the RTBA scale of fees, and, where local authorities are concerned, this makes considerable saving on rates.

There yet remains the problem of architectural work done by architectural assistants outside RIBA control, engineering assistants, estate agents and rent collectors, etc. It seems that as long as the public is content to pay for architectural work done by these people, and the existing methods of control are not fully used, the situation will deteriorate.

P. P. GROM.

Hebburn-on-Tyne.

How To Pay Less Income Tax

SIR,—D. Compton James omits one important piece of advice from his article entitled "How to Pay Less Income Tax." It is this:—Go to a chartered accountant, give him the full facts, and leave the rest to him. His training is in income tax law, and he will often save very much more than his fee.

PETER WHYMAN.

Cheshire.

Raising A Loan

SIR,—There has been a widespread idea that the contemporary approach to building and especially to housing has broken the ice and is now acceptable, at least to some people. This illusion led me to design a house for myself which actually suited both the site and my purpose.

After a mere twelve months I even managed to get the necessary planning and building permissions, and what's more I found a contractor both willing and capable of building it.

Now on approaching the Building Society (recommended by the ABS and therefore, I assume, by the RIBA) I find that I needn't have bothered. I was told "perhaps some time ago we might have considered it, *though of course the valuation would be lower and we couldn't allow more than 75 per cent. on contemporary work,* but now we have to stick to *the usual—you know—three bedrooms, two reception, tiled roof, that sort of thing. . . .*"

(Did somebody say reception rooms were dead? Anyhow, spec. builders' houses would do nicely, thank you.)

Perhaps the Tees-side boys are right and it is better to throw the remnants of your ideals overboard than not to build at all?

EDWARD H. HARTRY.

London.

Articled Pupilage

SIR,—It is high time the anachronism, "Articled Pupilage," was critically examined by the RIBA. It is likely that, as a result of this, the Institute may change its present policy of condoning the practice and providing model forms of indenture.

Articled pupilage, for three or five years, with or without premium, give the pupil, today, no advantages whatever. But disadvantages there are many:

If he is not to lose his local reputation and part of his premium he is tied to one office whether this may be good for him or not. Pupils usually remain articled. But is this wise?

If we take the instance of a student serving articles of five years duration, who has

(*Continued on page* 484)

As recently announced in the JOURNAL, *a Research Board has been appointed to make an annual award of a Research Fellowship. The members of the Board have now met (their names are given on page* 480*) and we publish below their statement which gives the amount of the award and the proposed subject for study for the first AJ Research Fellowship.*

AJ RESEARCH BOARD PROPOSES SUBJECT FOR

£1000 RESEARCH FELLOWSHIP

A statement of the problem

The general purpose of these Fellowships is to sponsor research which will directly benefit the architect in practice.

The Board proposes that the programme shall begin with a study of supply and demand as it relates to information for current office practice. No architect can carry in his head all he needs to know, even for ordinary day-to-day practice, and if his designs are enterprising his calls for information will be correspondingly greater. How far can an office or personal reference library meet his needs, how does he select what he puts into it, and is the right sort of material available for it today? When he has to go outside for his information, where does he go, where should he go, and do his sources meet his needs?

That is one side of the picture. On the other there is the continuous inflow of new literature, from research organizations, from the trade and from the journals: it covers the whole building gamut, from regional planning to the crystallography of cement, and is all intended to help. But much of it may be wasted. Can we define the needs better and thus help the suppliers to direct it more effectively?

It seems to us important that these and the cognate questions be answered as soon as practicable. Clear answers will help the producers of information, in all categories from laboratory scientists to journalists. And they will help the practising architect who, in the few moments he can give to reflection on his lot, will always find the need to be knowledgeable in such a vast field of arts and science impossible to meet until there is some stepping up of efficiency at the right points along the line of communication from source to drawing board.

The subject for study

The problem is to know which points to tackle and how. We therefore have proposed that the subject for study for the first AJ Research Fellowship should be:

> Information for the architect: what does he need and where will it come from?

Conditions of first Fellowship

To enable this study to be made, a research Fellowship of £1000 is offered, tenable for one year, or some other period by arrangement. The successful candidate for 1956 will be expected to work full-time and to reside within the London area. He will work as a post-graduate research Fellow at the Architectural Association at 34-36 Bedford Square, W.C.1, but he will be expected to visit research establishments and architects' offices in different parts of the country. Travelling and other incidental expenses—but not board and lodging—will be paid, and secretarial assistance will be available. The successful candidate will work under the direction of the Board and will be expected to keep a diary during his studies and prepare a report. This report, or portions of it, will, at the discretion of the Editors, be published.

The attention of those interested is drawn to the advertisement appearing on page CXIII.

Continued from page 482

passed his intermediate examinations after four, there is the tragic case of serving articles for one more year when, he may, in the free market, earn £500. Bearing in mind the other four years it becomes clear that the student has lost £1,000 income while paying £100 premium. It is true that this latter is sometimes paid back and often a few shillings are added.

The articled pupil learns no more than the normal assistant. His signed indentures represent a dubious testimonial of five years of artificially limited experience, when he has served his bondage, and are of no specific advantage whatever.

Only the ignorance of the facts concerning architectural education of students and their parents, significantly most frequently found in the smaller provincial centres, leads to the perpetuation of this evil way of acquiring cheap labour, often under false pretences.

The irrelevance of articled pupilage to architectural education is clearly reflected in the silence on the subject in the report of the Joint Committee published last February. I feel it is the duty of the RIBA to take a more positive step.

PAUL RITTER.

Nottingham.

Aim At Airtight Windows

SIR,—I am glad to see that someone else is interested in airtight windows. My reply very briefly to W. C. Moss (AJ: September 29) is that my suggestion was intended to convey a car-type window, airtight when you want it that way, and openable at will.

With T. M. Price (also September 29) I agree it is essential to conduct air to the fireplace by way of a duct but I am not satisfied that an underground pipe, smelly and insanitary dust trap, is the right answer unless it can be rodded clean.

May I say Congratulations to the JOURNAL for its pioneering a Research Foundation—now perhaps we shall see car-type windows disappearing through rubber strips into the wall cavity which has been waiting for them for thirty years!

J. E. JACKSON.

Folkestone.

Bad Wood Blocks

SIR,—We have had many well-justified complaints about the rough and unworkmanlike finish of wood blocks for electric switches.

Reputable manufacturers are continuing to supply to electrical contractors blocks made of good quality hardwood, but finished from the machine with ragged edges and surfaces which have not even been sandpapered.

We wonder if our experience is shared by other readers of your JOURNAL.

PRACTISING ARCHITECTS.

Kent.

Don't Be Snobs About Subtopia

SIR,—The abuse which has recently assailed the architects of the Tees-side is an appalling piece of professional snobbery. The dear boys whose eyes are thus defiled would, as was threatened, no doubt do worse than to take their coppers elsewhere. I suggest that were they to practise the gentle art of tolerance, whilst diligently proceeding with their own valuable contributions to the general good, all may yet be well in Snobtopia.

A. G. GREEN.

Stafford.

LIVERPOOL

H. R. Hitchcock at School's Annual Exhibition

The annual exhibition of work by students at the Liverpool School of Architecture and Department of Civic Design was opened last week, in the Walker Art Gallery, Liverpool, by Professor Henry Russell Hitchcock. He said that students might never be called upon to complete such elegant schemes as those on view, but at least by their example Liverpool could maintain its tradition of fine buildings, in the third quarter of the twentieth century. The students' work generally fitted into the consolidated pattern of what he chose to call the International Style. (There had always been an International Style in the West, although the form changed periodically.) He was glad, he said, to see that the School did not work on the "master" system. Schools, he felt, should not be dominated by any one personality, the purpose of a school being to help the student to find himself rather than to submerge him.

It was better, he said, to follow the students rather than the school and his advice on the choice of a place of education was this: "If you can find where the best men of your generation are, go there. By your own examples you will, as it were, lift each other up by your own boot straps."

Surveying the work of the School, its principal, Professor Gardner Medwin, observed that higher mathematics was now a compulsory subject in the first year and that for part of the third year students worked with the Liverpool College of Building. Specialization in fourth and fifth years was encouraged and he expected theses which would not necessarily be devoted to the study of a particular building.

There was, he said, a need for more research fellowships to supplement the two already in operation and he looked forward to the formation of a Department of Building Science in the University.

Sir James Mountford, the Vice-Chancellor of Liverpool University, replied that he hoped that by next year the Department of Building Science would be opened, but he held little hope for extending the present number of research fellowships.

ABS

Annual Ball

The Architects' Benevolent Society's ball will be held on Thursday, December 8, at Grosvenor House, Park Lane. It will be under the Presidency of C. H. Aslin, President of the RIBA. Nigel Birch, Minister of Works, will be among the patrons.

The ball is in aid of the centenary appeal fund for the building of old people's homes, which the ABS have undertaken to erect as soon as sufficient funds are available. Last year a profit of £2,500 was made on the ball, bringing the amount so far collected to nearly £20,000 out of the total sum of £50,000 required.

Tickets for the ball, at £2 5s. each, including supper, can be ordered from the organizing secretary at 55, Pall Mall, S.W.1. Tables for individual parties of six or over can be reserved. There will be a variety of side shows, and dancing from 8.30 p.m. to 2 a.m. to Sydney Lipton's Orchestra.

MOHLG

Slum Clearance: Purchasers Must Be Careful

In view of the resumption of large-scale slum clearance, local authorities are being asked by the Minister of Housing and Local Government (Duncan Sandys) to assist in protecting the public from ill-advised purchases of older houses likely to be included in slum clearance schemes. He has specially in mind people who wish to buy for their own occupation, including tenants who are considering the purchase of the homes they rent.

The Minister advises local authorities in a circular:

1. to issue a general reminder to the public through the Press, and in any other way they think proper, that they are preparing a comprehensive programme of slum clearance; and to make such other statements from time to time as they think fit;
2. to advise those who are proposing to buy older houses in the district to make inquiries at the Council offices in order to find out whether they will be affected by the slum clearance programme. Sometimes it may be difficult to give a very definite answer. For example, the house may be in an area intended either for immediate clearance or deferred demolition, but not yet precisely defined. But the Council's object should be to give the inquirer as much information as they reasonably can to help him in making his decision.

CORRECTION

Information Centre Omission

We regret that the name of the author was omitted from the information centre item number 10.137, which appeared on page 473 in the JOURNAL for October 6. The full heading should have been: *Studies in the functions and design of hospitals.* Nuffield Provincial Hospitals Trust. The report of a team sponsored by the Nuffield Provincial Hospitals Trust and the University of Bristol. Oxford University Press. 63s.

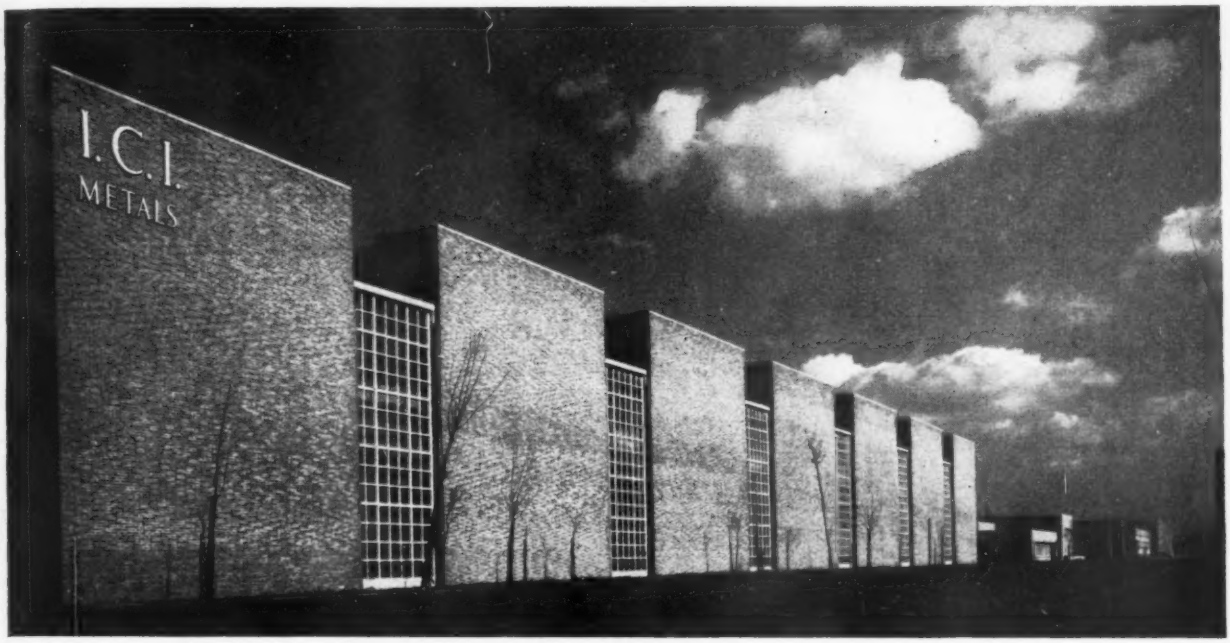
DIARY

Load tests on a 3-storey Reinforced Concrete Building in Johannesburg. Talk by Professor A. Ockleston. At the ISE, 11, Upper Belgrave Street, S.W.1. 6 p.m. OCTOBER 13

Concrete and Structural Form. Talk by Professor Pier Luigi Nervi. At Friends Meeting House, Euston Road, N.W.1. 6 p.m. OCTOBER 14

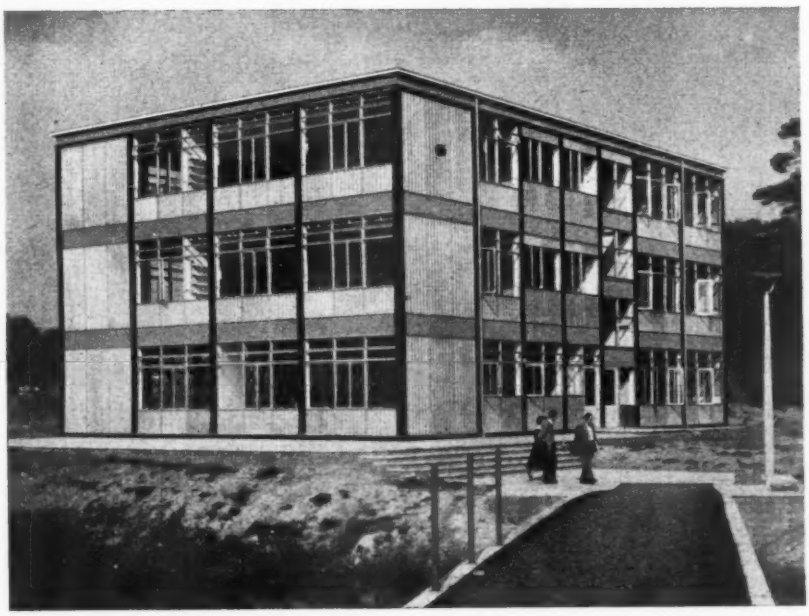
Reducing Buildings Costs by Better Organization. MOW talk. Chairman: G. W. Grosvenor. At the BC, 26, Store Street, W.C.1. 6 p.m. OCTOBER 18

BUILDINGS IN THE NEWS



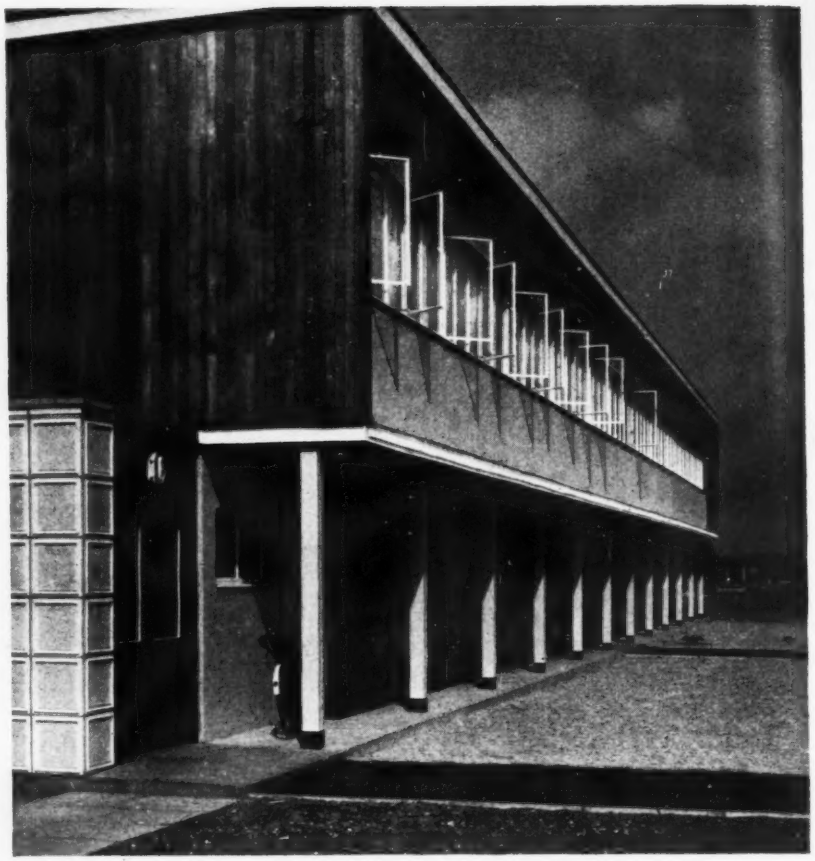
Factory at Kirby

The west block of the largest copper-tube factory in the British Commonwealth, the new works of ICI Metals Division, at Kirby, Yorkshire. The consultant architect was Sir Percy Thomas and the project was completed under the direction of the ICI Civil Engineering Department at a cost of about £5,000,000, one-third of this sum being taken up in building. The roof of the main shop covers seven acres and acts as a catchment area for the 1½ million gallon reservoir. All buildings have 11-in. cavity walls and 6-in. reinforced-concrete floor bases with ¼-in. case-hardened granite finish. The total superficial area of the buildings in the scheme is more than 470,000 sq. ft.



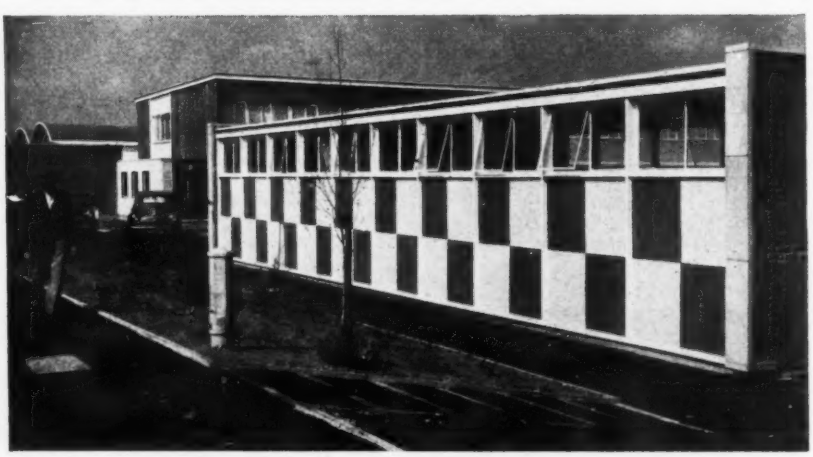
Comprehensive School, Coventry

The Whitley Abbey Comprehensive Secondary School is the first school where three-storey aluminium blocks in the Bristol Aeroplane Co.'s Mk. II construction have been used. This system has been developed in conjunction with the MOE for whom a similar school is now being constructed at Coventry. The teaching block, left, is part of the first 4-form entry instalment now nearing completion. Eventually the school will be 12-form entry. The school was designed in the City Architect's Department, Coventry (A. G. Ling, City Architect and Planning Officer, in succession to D. E. E. Gibson); D. E. Percival, Deputy City Architect; J. C. Barker, Principal Architect, Schools Division, and W. A. James, architect-in-charge. The school will be illustrated fully later.



Cattle Market, Gloucester

The new cattle market in St. Oswald's Road, Gloucester, is the first section in the development of a 35-acre site which will eventually contain buildings for marketing cattle, sheep, pigs and fruit, together with traders' exhibits, offices, snack bars, restaurant, abattoir, public house and industrial premises connected with the market. The scheme has been designed by the City Architect, J. V. Wall; the Deputy City Architect, T. W. Gregory, and A. Ault, architect-in-charge. The photograph on the right shows the south facade of the two sales rings, each of which accommodates 500 buyers on ramped seating. The rings are separated to allow auctioneers to operate simultaneously and the area of 135 ft. by 44 ft. has a light steel frame and r.c. slab foundations. Behind the sales area there is covered accommodation for 640 animals in an area of 35,000 sq. ft. A r.c. barrel-vault roof gives a clear floor area of 158 ft. by 63 ft. On the right are the public lavatories, near the main approach road. The contract price for the market, which will be illustrated fully in a later issue of the JOURNAL, *was £91,316.*



Offices, Welwyn Garden City

The new office block, left, for I.C.I. Ltd., Plastics Division, at Welwyn Garden City, Herts, was designed by E. D. Jefferiss Mathews, of J. Douglass Mathews and Partners (partner-in-charge, R. S. Poole). The offices, which are the first of several similar blocks to be erected, are 276 ft. by 35 ft. and have a pre-cast r.c. H-frame, prestressed-concrete joists and thin r.c. floor slabs. The consulting structural engineer was F. J. Samuely.

COMPREHENSIVE SECONDARY SCHOOL

in BROAD LANE, COVENTRY

designed by the Development Group, Architects' and Building Branch, MOE

chief architect, S. A. W. JOHNSON-MARSHALL

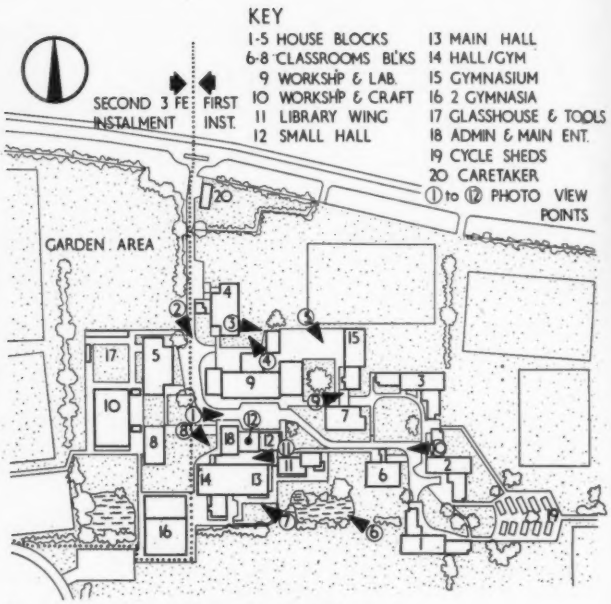
architects-in-charge, MICHAEL SMITH and J. E. TOOMER

in association with D. E. E. GIBSON, formerly City Architect, Coventry

quantity surveyors, J. NESBITT and N. ROSE, MOE

The buildings illustrated in this article comprise the first (and major) instalment of a 10-form entry Comprehensive Secondary School for boys ("Woodlands") carried out by the Coventry Local Education Authority and the Development Group of the MOE, in collaboration with the City Architect's Department. The scheme is interesting in two ways; firstly, as an attempt to solve the problems inherent in providing a school for a total of 1,650 boys, from 11 to 18 years of age, of all aptitudes and abilities, without creating a vast institution; secondly, as the next phase of development of the system of construction and modular planning used by the same Group of architects at the Wokingham Secondary School for the Berkshire County Council, illustrated in THE ARCHITECTS' JOURNAL of October 16 and December 4, 1952, and January 8, March 12, and July 23, 1953, and fully described in MOE Building Bulletin No. 8. The general contractors were Higgs & Hill Ltd. For sub-contractors see page 510.

Viewpoint 1, workshop block left, and three-storey classroom block centre.



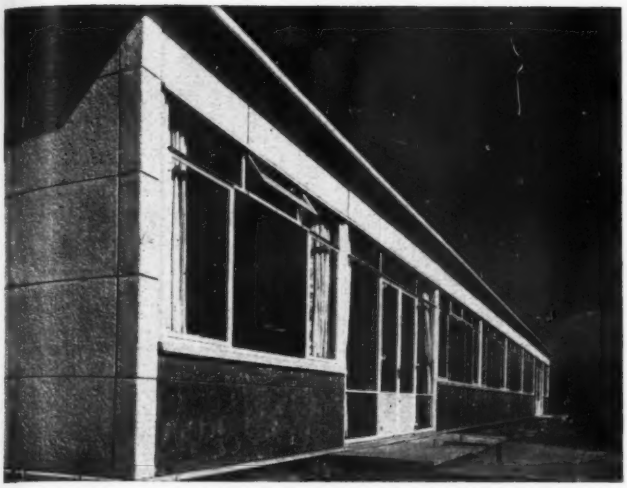
Key plan showing photographic viewpoints

SECONDARY SCHOOL AT COVENTRY

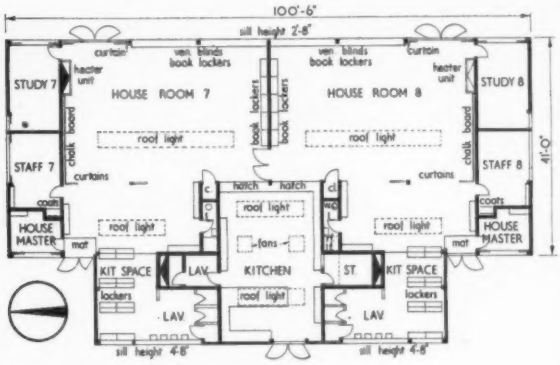
Viewpoint 1 on the previous page illustrates the buildings around the central area of the scheme and shows how the planning solution has resulted in the feeling of a related group of buildings serving a small community, rather than a vast institution in either the contemporary or old fashioned manner. The varying elevations indicate how the design of buildings using a " meccano " set of co-ordinated parts can lead to architecture of a high quality with an underlying sense of order and discipline, classical in its feeling and yet capable of variation from the starkness of the entrance porch to the central block (18), to the gayness of the south elevation of the workshop and laboratory block (9). Here three dimensional relief is introduced by the projecting balconies and the large elevation is made interesting by the employment of two types of faced concrete (Derbyshire spar and green Welsh granite chippings) panels of facing brickwork (Leicester red-sandfaced), glass ply infilling panels between glazing, and vertical hardwood (keruing) boarding beneath the balconies. The three-storey classroom block (7) on plan in the centre illustrates the basic pattern of the fenestration system in which the glazing between sill and the 6-ft. 8-in. transome is based on 2-ft. 6-in. side hung casements (in rooms) whilst above and below, opening and fixed lights relate to the 3-ft. 4-in. grid of the building. Planting in precast flower pots adds relief to paved surfaces and helps to canalise pedestrian traffic.

Top, viewpoint 2, showing main oil storage cylinder (capacity 15,000 gals.), flue stack to boiler house of the workshop and lab. block and houseblock 4 in foreground. Infilling between windows on the west gable wall of the workshop block is in glass ply with olive green (Archrome 32) backing. The flue and storage tank are painted in aluminium paint. Seat units are in precast concrete with oak seats.

Above left, viewpoint 3: the outdoor building trades shelter is an Arcon " three pin " structure in welded tube and rod with an asbestos roof. The main tubes are painted black and the infilling struts yellow. The gymnasium block (15) is seen on the left and the single-storey metalwork centre of the workshop and laboratory block is seen on the right.

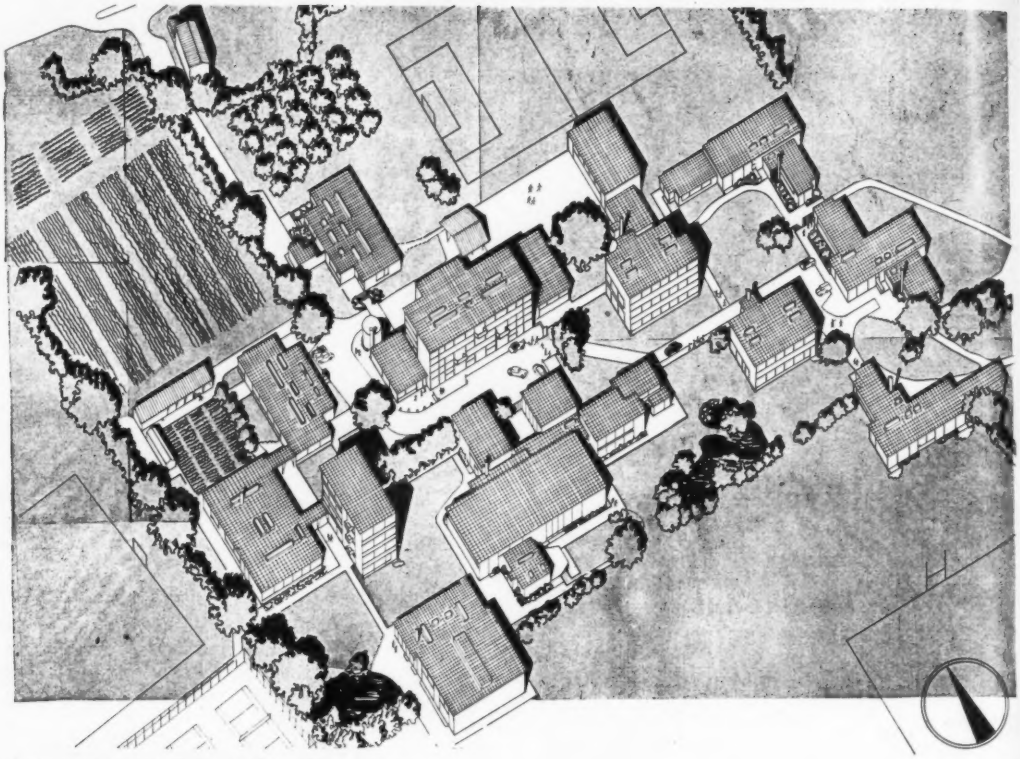


Top, viewpoint 4, elevation of houseblock 4, showing contrasting use of two cladding finishes and vertical boarding. Above, view across playgound from viewpoint 5, looking towards the 3-storey classroom block 7, showing local boilerhouse for both units. Water storage for changing rooms is provided in a tank on the roof of the gym. This is cased in weatherboard.

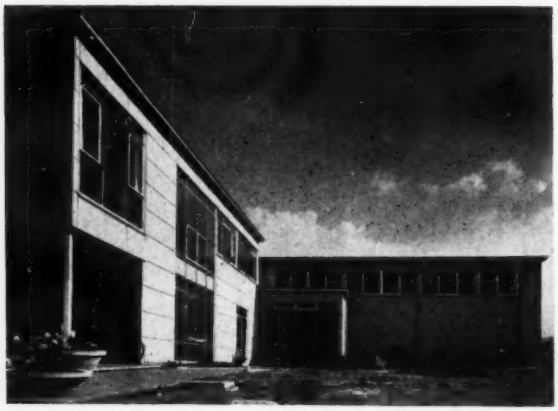


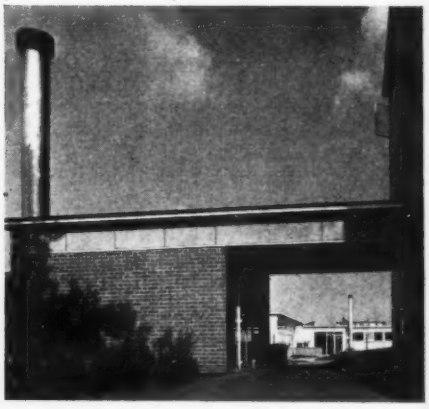
Ground floor plan, Block 4.
[Scale : $\frac{1}{32}$" = 1' 0"]

Below, viewpoint 7, the main hall from the south-east, with outdoor theatre on the left. The chequer pattern of alternative cladding illustrates the increasing architectural vocabulary of this system. The exposed aggregate face to the outdoor stage front was achieved by applying a " retarder " to the shuttering and wirebrushing the face. The " weephole " drains are in polythene offcuts from the laboratory drainage system. Note the neat solution of r.w.p.'s achieved by use of one-length aluminium alloy tubes.
Bottom, library group of central block from the south-east (viewpoint 6). The cladding on the southern elevation of upper floor is painted black.



Axonometric view of the site from the south-west.



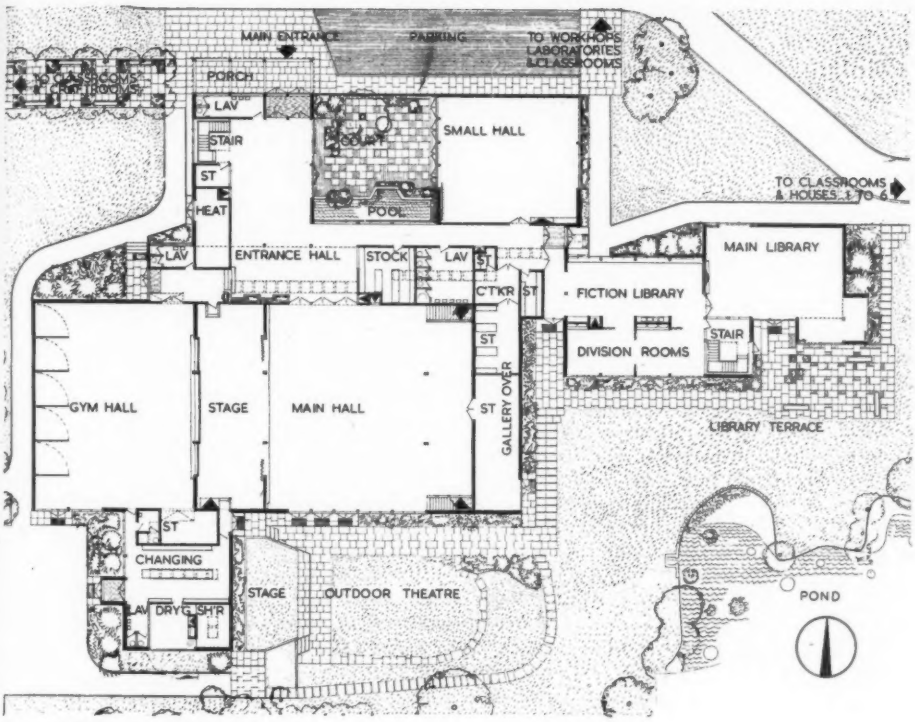


SECONDARY SCHOOL AT COVENTRY

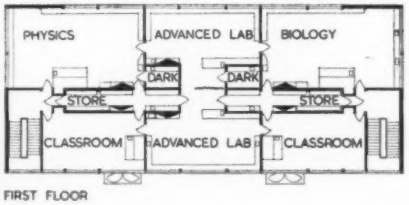
Viewpoint 8, above left: the entrance hall and gym. hall. Cladding blocks to porch, recessed wall and corner building are painted in red emulsion paint. The bracing beam behind the staircase window is cased in fibrous plaster to provide requisite fire protection of the structure.

Above, view through boiler house of classblock 7 looking toward houseblock 3 (viewpoint 9). Note the pleasing combination of brickwork and cladding and the clean lines of the design. The flue is cased in aluminium and has an experimental cowl as an alternative to the usual " chinaman's hat."

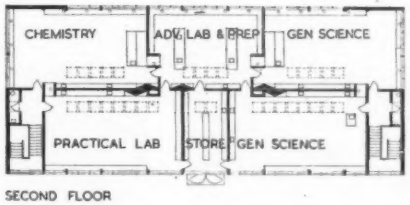
Left, viewpoint 10: boiler house, two-storey classblock (6) and three-storey classblock (7). The glass ply panels to the nearest elevation of classblock (7) are coloured dark red (Archrome 7).



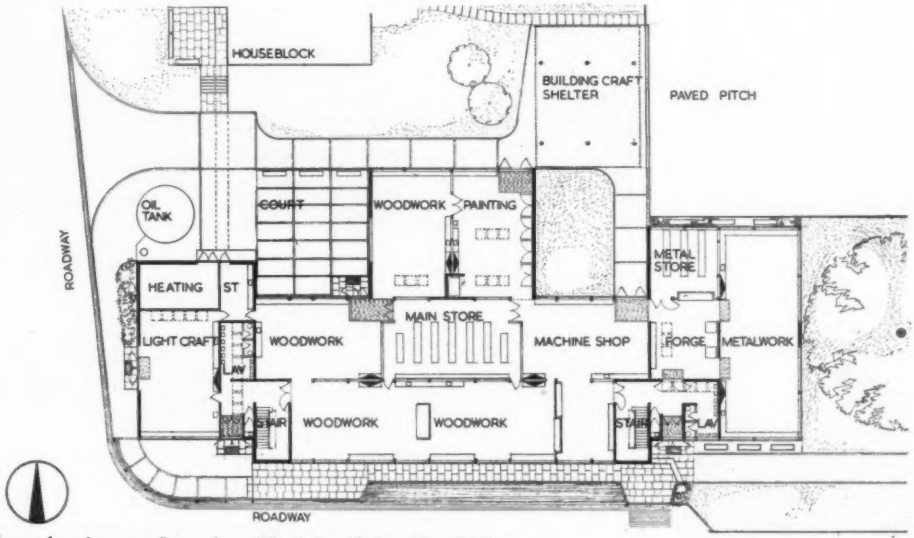
Ground floor plan, Blocks 11, 12, 13, 14 and 18. [Scale: 1/32" = 1' 0"]



FIRST FLOOR

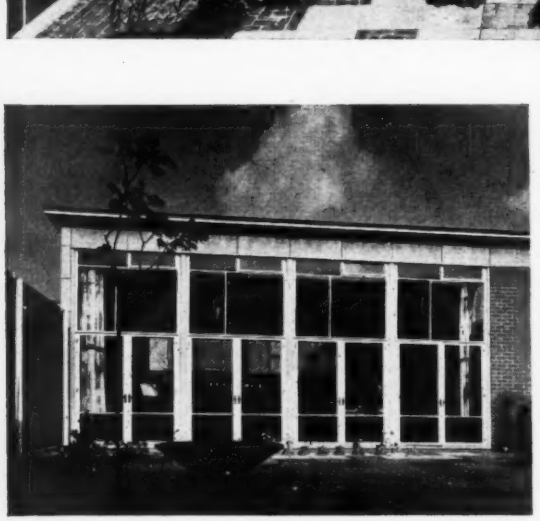


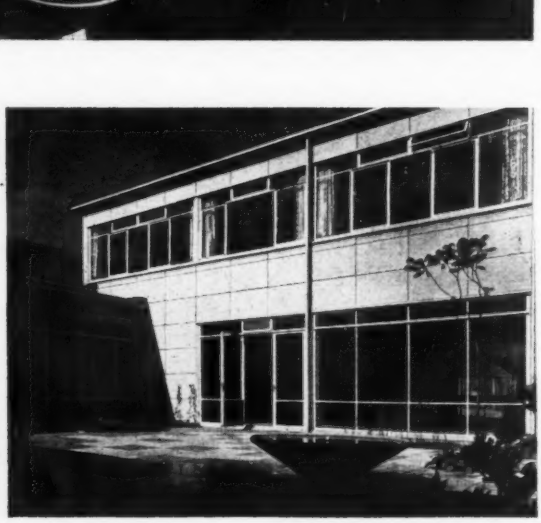
SECOND FLOOR

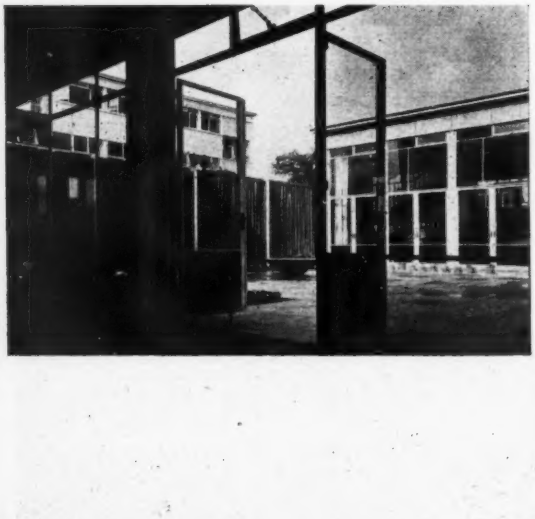


Ground and upper floor plans, Block 9. [Scale: 1/32" = 1' 0"]

Right, typical roofscape of central block, viewpoint 11. The rooflight upstands have pivot vents when required. Spandrel ends are covered in mineral finish felt. The roof generally is covered with red granite chippings as a topping to bituminous felt roofing.







The photographs on this page show views in four directions (grouped around viewpoint 12) of the court developed between main entrance (block 18) small hall (12) and main hall (13) of the central block group.

This court which has received great care in detailing, including a planting scheme, provides a delightful centre to the loosely articulated units of the central block. The paving consists of precast concrete slabs and red brick paviors in an informal pattern, with earth beds planted with low-growing shrubs interspersed with larger trees. The paving in this courtyard and the screen are illustrated as Working Details in this issue.

Top, looking north over the slatted louvre screen, which is in oiled keruing, towards the southern elevation of the workshop and laboratory block.

Centre left, looking east to small hall. Doors here are 3 ft. 4 in. wide as they are only used in fine weather to open up the hall to the court. The precast fountain bowl, fountain jet and pipe in polythene add further interest to the court.

Above, looking west to main entrance hall. The staffroom is above. Bottom, looking eastward into court from main entrance hall, through fully glazed external screens.

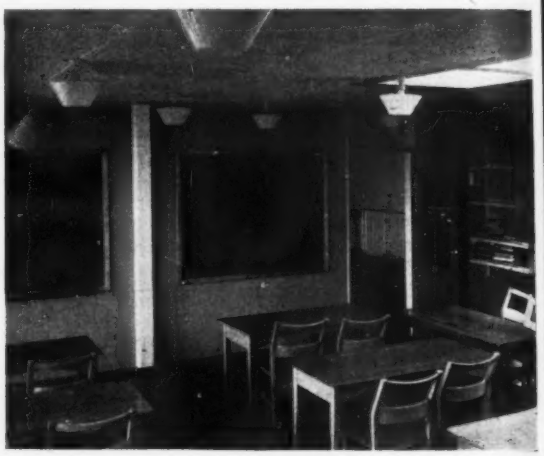
Left, this is the view obtained on entering the entrance hall of the central block (18). The floor is of studded rubber tile, developed by the MOE with a rubber company and extensively used in this project. It has the advantage of quietness and easy cleaning (colour: grey and red chequer pattern). The ceiling is in precast vermiculite concrete panels (as fully described in MOE Bulletin No. 8, pages 82-3). Colour: right wall pale buff (Archrome 9). Ceiling, sprayed white. The mobile cloak rack was designed by Bernard Schottlander. The mural painting was carried out by Norman Adams (as were the paintings in the main library) and depicts the fall of Icarus.

SECONDARY SCHOOL AT COVENTRY

Right, a view of the staircase in the main entrance hall. The strings are in welded structural steel, painted pale grey (Archrome 44), balustrade white, and handrail in polished teak. Treads are in precast concrete with rubber surface and aluminium nosings. Note the fibrous plaster beam casings (painted white). The storey-height door frame in pressed metal illustrates the standard solution. This avoids any dangers of the partitions cracking over lintols, and forms suitable stops for change of colour or other decoration. This is particularly useful in a system where there is no regular expression of panel and structure. Note the grouped electrical equipment: top to bottom, firebell, two thermostats, fire alarm push, switches and 13-amp. plug socket. Below, view of the assembly hall from the open gallery at the rear. The frame of this hall is of interest. It was designed to use standard components as far as possible and four intermediate columns were therefore tolerated. These

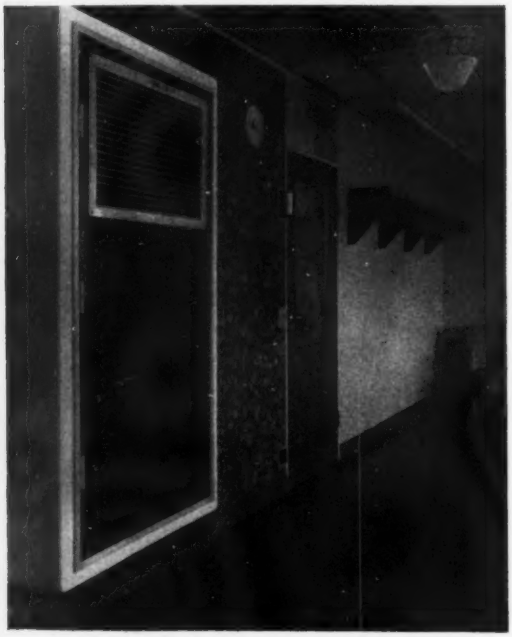
support special main beams (partially cased in fibrous plaster) which in turn receive 20-ft. span roof beams to which the suspended fibrous plaster ceiling is fixed. The central panels of the ceiling are in reeded fibrous plaster painted blue-grey to emphasise the special chandeliers (designed and fabricated by Bernard Schottlander in collaboration with a member of the design team). The rods are in grey stove-enamelled steel jointed on assembly with aluminium sleeves and "Allen" screws. Remaining ceilings are in perforated fibrous plaster panels between f.p. rails. The light fittings are a type developed by the MOE group (200-watt fitting) alternated with recessed fittings fitted with spotlight lamps to add sparkle to the lighting system. The fibrous plaster ceiling is self-finished in white. The floor finish is of 12-in. sq. chipboard tiles. Right, a close-up of the proscenium head, curtains and ceiling. The curtains are in applique technique, depicting scenes from Greek mythology. The proscenium head is in fibrous plaster having a similar motif and a sculptor (I. Fowler) was commissioned for this design. Colour: grey. Side flanks: blue-grey. The stage opens at the rear on to the gymnasium hall by sliding screens.

Right, view through division room 2 of the library block. The easy chair (designed by Oliver Cox) has a movable reading tray fixed by brass dowels into ferrules in the arms. The fabric is washable. Floor: putty-coloured studded rubber tiles. Panels below window sills: asbestos backed glass ply, painted pale grey (Archrome 43). Vermiculite ceilings sprayed white. Radiators gloss pale grey (Archrome 43). Note the curtain track which divides division room 1 and 2. Below, main library. Chandelier by Schottlander. The central area of the ceiling (reeded fibrous plaster) is painted black as a contrasting background. The remaining ceiling is in fibrous plaster with reeded self-finished panels. The murals by Norman Adams depict scenes from the Odyssey. High level wall panels and fibrous plaster stanchion casings while library shelving in oak. The studded rubber floor in putty, coloured joinery doors are birch plywood faced. Door furniture is anodised aluminium. Below, right, typical classroom: ceiling vermiculite, sprayed white. Walls fibrous plaster painted. Floor: p.v.c. sheet. Shelving: stove enamelled steel. Chalkboard, on left: a painted hardboard with chalkboard painted blue (Archrome 39). Pin-up board: a medium hardboard painted khaki (Archrome 23), with hardwood surround. Teaching wall, pale blue (Archrome 34); right wall, blue Archrome 39).



Below, a typical detail of a warm air heater unit in the main staff room. The front access door is painted black. The outlet louvre is in anodised aluminium. Air intake is through the bottom. (See detail 55, page 89 of MOE bulletin No. 8.) Floor finish marbled green p.v.c. Skirting painted softwood. Door frame painted glossy pale grey (Archrome 43).

Below right, typical kit storage lockers. The lockers are arranged in tiers of 3 in banks of 5 to give 15 per side or 30 in an island unit. Each door locks 3 units. The carcase is in painted softwood with interiors in galvanized wirework for max. ventilation. The batten strips cover the timber joints. Lockers are painted white with black doors.



Above, this view shows a " houseroom " (in houseblock 4) arranged for dining. On the right is the servery which serves both rooms. The ceiling is in fibrous plaster, consisting of rails fixed to roof beams with perforated fibrous plaster in filling panels. This is a less expensive ceiling developed from that used in the assembly hall. The rooflight is lined in fibrous plaster with baffles at 3-ft. 4-in. centres to reduce glare. The pupils' book lockers consist of painted softwood eggcrate with varnished plywood tip-up doors (MOE bulletin 8, page 35). The colours are: wall behind lockers yellow (Archrome 15). Ceiling: white. Rooflight : pale grey (Archrome 43). Floor : green. Below left, a general science laboratory. The built-in fume cupboard centre left, will appear as a Working Detail in a later issue.

SECONDARY SCHOOL AT COVENTRY

Above right, a view of the machine shop. Ceilings have woodwool panels for maximum sound absorption. Screwed conduit is used for electrical services. Floor is dustproofed granolithic. The machines were dealt with direct by the Education Department and were installed by a local firm of millwrights. Some of the machines were stuck down with glue-soaked felt in lieu of the more conventional ragbolt technique. Note the circuit breaker switches on the dropper, left of the double doors. These replace conventional fuse boards and give better protection to circuits with less trouble, as the circuit is restored by pressing the switch.

Right, a gymnasium (15). Ceiling vermiculite unpainted. Recessed light fittings. The swing-out wall bars illustrate the current trend in equipment of gymnasia. The floor is seraya treated with gymnasium oil. The wall surfaces are the standard plaster board lining to the concrete cladding block (the fourth wall is fair faced brick).

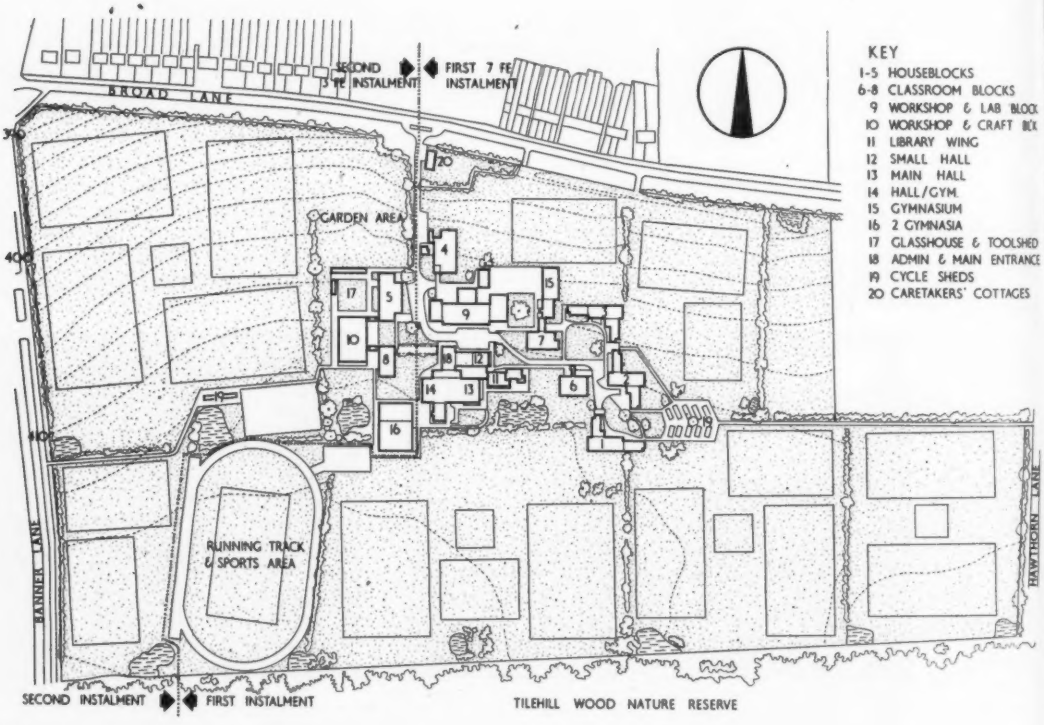
SECONDARY SCHOOL AT COVENTRY

CLIENT'S BRIEF: his stated requirements

A comprehensive secondary school for 1,650 boys, or 10 forms of entry (capable of ultimate expansion to 12 forms of entry) to be built in two instalments, the first to provide 7 forms of entry for 1,050 boys. (The second instalment is now under construction.) The school will provide secondary education for all the boys from a given area, and is one of five such schools planned to overcome the shortage of secondary schools caused by war damage, the expansion of the city and the provisions of the 1944 Education Act. The special educational problem posed was to cater for all aptitudes and abilities over a wide range of courses without creating a large impersonal institution in which the individual boy would feel lost. The solution was to adopt the "House System" and the functional breakdown of teaching accommodation. These principles had been investigated at an earlier school and this scheme was to be a development project to be carried out within the MOE cost limits of £240 per place. After a detailed analysis of the proposed curriculum, and time tables a schedule of accommodation was prepared and this was allocated (in co-operation with the architects), to 18 different building units.

SITE: topography, surroundings, access, planting

The site allocated within the City development plan covers 52 acres some 3 miles from the centre of Coventry. It is approached from Broad Lane which is to the west of the Coventry-Birmingham Road. On three sides, to the north, east and west, are large housing schemes from which the pupils will be drawn. On the south side is a nature reserve, from which the school takes its name. The site is fairly level with a maximum fall of 20 ft. It consisted of agricultural land with hedgerows, trees and ponds, as many as possible to be preserved within the scheme. Main access is provided from Broad Lane with secondary access for pupils from Banner Lane (west) and Hawthorn Lane (east). The playing fields which surround the school are being developed by the City's Parks Department. A detailed planting and landscape development plan was prepared by the architects and the Parks Department.



Site plan

PLAN: general appreciation

The buildings and roads occupy some 6 acres of the central area of the site with the vehicular access road from the north winding between the buildings, with local car parking and subsidiary pedestrian paths. The caretakers' cottages control the main entrance. The accommodation having been broken down into associated activities was finally resolved in 18 units some of which are linked to give a total of 13 blocks plus ancillary buildings. Of these, four units comprise the second instalment. The central block (administration and entrance hall, hall/gymnasium, small hall, and assembly hall), the workshops and laboratory block, and a typical houseblock are shown in detailed plans on pages 489 and 491.

The central block group forms the hub of the project with the other units loosely arranged around. The importance of this central area is accentuated by the concentration of three and four-storey units around the main car park. The single-storey elements are built around the perimeter. The houseblocks are kept towards the perimeter, as are the gymnasia which are planned so that changing rooms may also serve the playing fields. Bicycle sheds are situated at the junctions of the east and west approach paths

PLAN: general appreciation (continued)

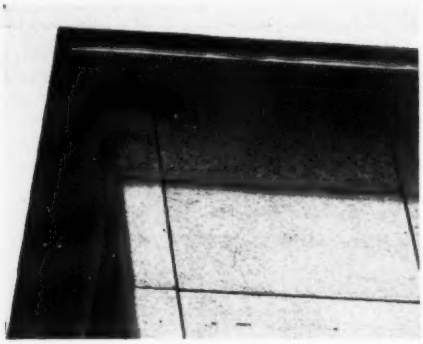
with the main complex. The relationship of the individual buildings has no obviously formal basis. The detailed planning and massing of the units are similarly informal resulting from detailed functional analysis of the optimum arrangements to suit the users. Several of the units are resolved into basically simple masses, but the complex relationships of buildings tends to give a confusing first impression and it is obvious that the visitor must learn his way about with the aid of plans or signposts.

MAIN CONSTRUCTION: general appreciation

The system of construction used is similar to that developed by the MOE architects and Messrs. Hills (West Bromwich) Ltd., and as used at St. Crispin's School, Wokingham, Berkshire (fully described in MOE Building Bulletin No. 8). Detail developments only were made to the structure and the first instalment commenced with the Mk. I (Wokingham) frame but progressed early to Mk. II. The second instalments are being carried out in the Mk. III version. These changes are generally only in detail and illustrate the progressive development of this system towards maturity. The Mk. I and II frames are based on the 3-ft. 4-in. plan module with an 8-in. vertical module. The frame consists of standardized fabricated welded and hot dip galvanized system of stanchions and lattice beams with bolted connections. Floors are precast concrete modular units 1½ in. thick and roofs are 6-ft. 8-in. × 1-ft. 8-in. × 2½-in. heavy duty woodwool slabs. External cladding consists of 1-ft. 8-in. thick faced concrete on 2-in. woodwool core with plaster-board stuck to the inside face with wet plaster as adhesive. Windows are standard steel sections in pressed metal trim. Internal partitions are 6-in. honeycomb core gypsum plaster partitions. In this stage of the development the main changes were (*a*) the single-storey stanchions were fabricated from four 1½-in. × 1½-in. rolled angles with ring batten stiffeners in lieu of the 4-in. pressed metal stanchions. (*b*) The elevational steelwork required to fix the cladding blocks was factory welded into frames to reduce sitework and increase the degree of accuracy. (*c*) The precast concrete eaves block was extended and acts as an eaves brace, thus reducing the complex eaves windbracing previously required. (*d*) The plaster-board inner face of the cladding block is stuck on instead of being nailed to a sawdust cement skin. (*e*) The internal partitions are a standard 6-in. dimension in lieu of the 5¾-in. previously used. This resulted from the increase in size of the stanchion and enables the partitions to encase the stanchions without special casings. (*f*) An improved technique was evolved to reduce cracking in the internal partitions. This involved applying fibrous plaster filling strips on hessian backing over internal stanchions. This replaces the earlier technique of a skin coat of plaster over plaster-board strips. (*g*) Alternative ceilings in fibrous plaster technique have provided a useful addition to the range. (*h*) Curtain walling technique is also used to vary elevational treatments. In the Mk. III version of the frame the lattice beams are redesigned for economy and the characteristic rod infilling is changed to angles and flats. The basic stanchion becomes 5 in. square, built up of pressed-steel plate seam welded and with slightly rounded corners. In single-storey areas where no special structural fire precautions are required, these may therefore be left uncased. The vertical module becomes 6 in. There is no doubt that this scheme thoroughly tests the flexibility claims of the structure which is capable of very diverse use up to five-storey construction.

The photographs above and on the next page illustrate the solutions employed in this system to the standard conditions familiar to designers and users of component prefabricated systems of construction. Above, the junction of low block eaves to a higher building shows the neat solution developed in the system. The copper flashing of the wall block above the eaves is cast in on manufacture and dressed down over the upstand of the roofing felt on site. The eaves block in this system is a stage of further development in which the block acts as a wind bracing thus eliminating complex eaves-bracing members. The fascia is painted softwood and the soffit is sand finished on manufacture, thus avoiding painting and maintenance cost. (The internal corner trim painted dark grey (Archrome 47) is illustrated on diagram 39, p. 64 of MOE Bulletin No. 8.)

Above right, sill condition at external corner, showing window and cladding conditions with corner block. The sill is in galvanized pressed metal painted pale grey gloss oil paint (Archrome 44), as also are the pressed metal window trim. Window sashes are painted gloss white. The edge beam is painted in black bitumen. The cladding shows the texture of the Derbyshire spar faced concrete cladding.



Above, detail of eaves block, showing mineral finish roofing felt and welted drip to softwood fascia. The use of the cladding block over the window head is characteristic of this system, reflecting the use of constant depth roof beams with suspended ceilings. In conjunction with the overhanging eaves, this tends to have the appearance of the cornice and frieze of the classical orders.
Right, a typical glazed metal door. Note pressed metal trim, gravity-catch door holders and galvanized footscraper which is arranged for the easy cleaning out of the recessed threshold.

MAIN CONSTRUCTION

Load-bearing element	*Location*	*Beam spans*	*Column grid*	*Reasons*
Welded galvanized steel box stanchions and steel lattice beam bolted frame throughout	On 3 ft. 4 in. modular plan grid. Positions according to planning requirements	3 ft. 4 in. multiples to max. 13 ft. 4 in. for perimeter beams and to 26 ft. 8 in. for main floor beams. Secondary beams at 3 ft. 4 in. centres	Perimeter 3 ft. 4 in. multiples to 13 ft. 4 in.; 13 ft. 4 in. × 26 ft. 8 in. max. for floor bays. Stanchion sizes 4½ in. × 4½ in. single-storey, 4½ in. × 7½ in. two and three-storey 4½ in. × 8 in. Hall	To standardize conditions. To simplify manufacture and erection and facilitate advance ordering and stockpiling

Foundation type	*Location*	*Sub-soil*	*Depth*	*Reasons*
Mass concrete pads	Under stanchions	Sandy clay, 2 tons safe bearing	1 ft. or 2 ft. below finished floor level for base plates	For detailed treatment and explanation, see MOE Building Bulletin No. 8

Outer wall type	*Location*	*Material*	*Finish*	*Reasons*
Built-up single skin modular cladding metal windows in pressed metal trim. Some glass ply infilling. Some face brickwork panels	Outside stanchion face	1½-in. faced dense concrete on 2-in. woodwool core with ⅜-in. plasterboard inner face	Derbyshire spar and white cement. Green Welsh granite chippings	Ditto

Roof type	*Location*	*Material*	*Finish*	*Reasons*
Flat modular dry units	Throughout	2½-in. heavy duty modular woodwool slabs 6 ft. 8 in. × 1 ft. 8 in. on secondary beams, cement sand screed	Two-layer bituminous felt stuck to screed and with red granite chippings	Ditto

Floor structure type	*Location*	*Material*	*Finish*	*Reasons*
Modular precast panels. Joints grouted with continuity rods	Throughout panels span 3 ft. 4 in. Size 3 ft. 4 in. × 1 ft. 8 in.	Precast reinforced concrete 1½ in. thick with stiffening ribs. Slabs rest on insulation strips	Cement sand screed and various thin floorings. Studded rubber pvc sheet	Ditto

Internal wall type	*Location*	*Material*	*Finish*	*Reasons*
Factory-made unit panels	Throughout	Gypsum plaster-faced honeycomb core 6 in. thick overall. Generally plaster skins are ⅜ in. thick. Staircase enclosures, plaster skins are 1 in. thick (for additional fire and sound precautions) In heating chambers and high fire risk areas, the core is filled with expanded clay aggregates	Factory finish with site jointing. Oil paint	Ditto

Ceiling types	*Location*	*Material*	*Finish*	*Reasons*
Modular panels, dry construction	Soffit 2½ in. below underside of structural beams	Vermiculite concrete fibrous plaster slotted or reeved. Some woodwool panels	Sprayed oilbound water paint. Majority of fibrous plaster, factory finish	For detailed treatment and explanation see MOE Building Bulletin No. 8

ARTIFICIAL LIGHTING

Source and fitting type	*Location*	*Illumination level*	*Comments*
Tungsten semi-indirect	Ceilings—throughout	Regulation	Varied by using some direct fittings to add sparkle and interest
Special fittings (chandeliers)	Library and assembly hall	Regulation	

Wiring and switching types	*Location*	*Reasons and comments*
Braided cable and some PVC	Throughout	Speed of installation, suited to construction. Circuit breaker switches used in lieu of fuseboards, easier maintenance

Power supply type	*How distributed*	*Comments*
13-amp. 3-pin outlets	Braided cable in suspended ceiling	Ditto
Some 3-phase to workshops	Some conduit used in workshops	

NATURAL LIGHTING

Wall glazing	*Location*	*Reasons and comments*
Galvanized steel windows casement, top hung or horizontal centre hung according to height above floor and size of opening light	Sills; 0 in., 2 ft. 8 in., 3 ft. 4 in., 6 ft. 8 in., 11 ft. 4 in., 13 ft. 4 in., etc.	Opening lights standardized. Spiders normally coupled on 6 ft. 8 in. transome, but where reaching floor to ceiling coupled also at 2 ft. 8 in. Casements below 6 ft. 8 in. Side hung. Casement widths 2 ft. 6 in. Top hung or pivot hung 3 ft. 4 in.

Roof glazing type	*Location*	*Reasons and comments*
Single pitch with horizontal centre hung vents	As required by plan	Used to reduce ceiling heights and allow more flexible planning
Galv. metal upstand and frame		Cross baffles reduce sky glare Fibrous plaster linings

THERMAL INSULATION

Type	*Location*	*Value*	*Comments*
Wood wool in precast concrete cladding (2 in.), 2½-in. woodwool slabs	Walls Roofs	Thermal transmittance 0·21 appox. 0·20 (plus ceiling value)	Based on Wokingham system and found to be successful in practice

HEATING AND VENTILATION

Heat exchanger type	*Location*	*Temperature and air change rate*	*Reason*
Patented warm air units in cabinets	Throughout. To suit various room layouts	In accordance with MOE requirements	Economical capital and running cost
Vertical and horizontal types			Horizontal types used in Phase 2 to reduce temperature gradients

Boiler type and capacity	*Fuel type*	*Stoking method*	*Reason for choice*
Cast iron sectional boiler. One boiler to each block with exception of Science, Craft and House block 4 which has two boilers in one boiler room. Sizes vary according to heat load of blocks	200 second fuel oil Central oil storage	Oil burner. Pressure jet type fed from central oil storage tank by underground oil line. Automatic thermostat control	Capital cost Oil firing with pumped fuel suitable to planning of detailed blocks

Water heater type	*Location*	*Reason for choice*
Electric water heaters (storage type)	For isolated sink units with small load	Draw off points a long way from nearest hot water circulation

Hot water storage type	*Location*	*Materials*	*Capacity*	*Comments*
Lagged indirect cylinder fed from main or heating boilers	When possible adjacent to area of hot water service demand	Galvanized cylinder and circulation	To suit individual requirements of blocks	Suitable to dispersed plan

Pipes and jointing type	*Location*	*Materials*	*Comments*
Heating pipes black barrel with screwed malleable fittings. Hot water service secondary loops as above but galvanized	Mainly in roof space	Black barrel	Saving in floor ducts. Accessible via demountable ceilings

Cold water storage	*Location*	*Materials*	*Capacity*	*Comments*
Storage allowed for hot water service cylinders and mixing valves mainly. Galvanized tanks	Over house blocks 1, 2, 3. Assembly block gym. block 1 and craft science block	Galvanized iron, open top tanks	Total approx. 1,600-galls.	School fed mainly from rising main

ADDITIONAL INFORMATION

Broad Lane Comprehensive School, Coventry, was one of the first schools of this type and, in view of the fact that it consisted of a large number of separate buildings, a preliminary survey was made to see whether separate boiler plant (one boiler per building) was more economical than a central boiler plant with connecting external ducts to each building. It was found that separate plants for this particular site layout were more economical and oil was chosen as a fuel in view of the rising solid fuel costs and the difficulty of providing solid fuel storage space in or adjacent to the boiler house of each building. If solid fuel had been chosen, it would have meant that roads constructed with sufficient strength to take fuel delivery lorries would be required right across the site, serving each building.

Oil is stored in one central storage tank, cylindrical in shape and standing vertically. This tank has a partition in the middle which, in effect, gives two separate compartments, these being used alternatively so as to give the fuel a chance to settle after each delivery and also guard against a breakdown in any one tank. From these tanks oil is pumped in a single pipe to each of the boiler houses. This pipework is buried in the ground adjacent to the water mains. The filling point to the tank is located at the boundary of the school so that, again, oil tankers can remain in the roadway outside the school premises and it was not necessary to construct the school roads of sufficient strength to stand the weight of these large vehicles.

It is interesting to note that boiler houses as generally known are non-existent in this school. The boiler rooms themselves are constructed like other rooms in the building. Steel flues have been used and these two factors made considerable savings in builder's work.

The oil burning plant and pumps have been standardized so that maintenance should be a simple matter. A school engineer has control of the plant but, apart from regular cleaning of burner jets and electrodes, very little attention is necessary to the heating plant. Fully automatic controls are incorporated on both the boilers and the heating inside the school, with means for shutting down plant at nights and weekends to a very low level.

Hot water service has been dealt with in two ways—

(*a*) Major demands, such as groups of lavatory basins, housecraft room etc., are dealt with from local indirect cylinders fed from the adjacent heating mains.

(*b*) To serve very isolated single basins or draw-off points, electric water heaters have been installed. This not only saves in the cost of lagged pipes from the nearest water mains to the draw-off points but also in running costs for, one should remember, heat is being lost continuously in hot water circulations whether water is being drawn off at the taps or not.

Cold water storage has been kept to a minimum on this school, all the hot water points being fed directly off the Water Company's main. This has undoubtedly made a large saving in that there is no duplication of high pressure and low pressure services.

REFUSE METHOD

Method	*Type of refuse*
Dustbins	Kitchen, classroom and workshop waste

SPECIAL ACOUSTICAL TREATMENT

Sound Absorption Material	*Location*	*Absorption coefficient*	*Comments*
Woodwool	Ceilings and walls	No figures Based on practical experience of previous projects	Woodwool ceiling panels used for noisier areas such as workshops
Rocksilk	Walls		
Vermiculite tiles	Ceilings		
Perforated ceilings with glass silk backings			

Sound insulation	*Location*	*Insulation standard*	*Comments*
Partitions with 1-in. plaster faces	Between classrooms	Based on practical experience on previous projects	Studded rubber to reduce impact noise
Soft finishes	Floors		

SOIL WASTE

Type of system	*Location*	*Materials*	*Method and comments*
One pipe	Normal	Copper	Preformed
	Lab. block	Polythene	Combined with standing wastes or tun dishes

WORKING DETAIL

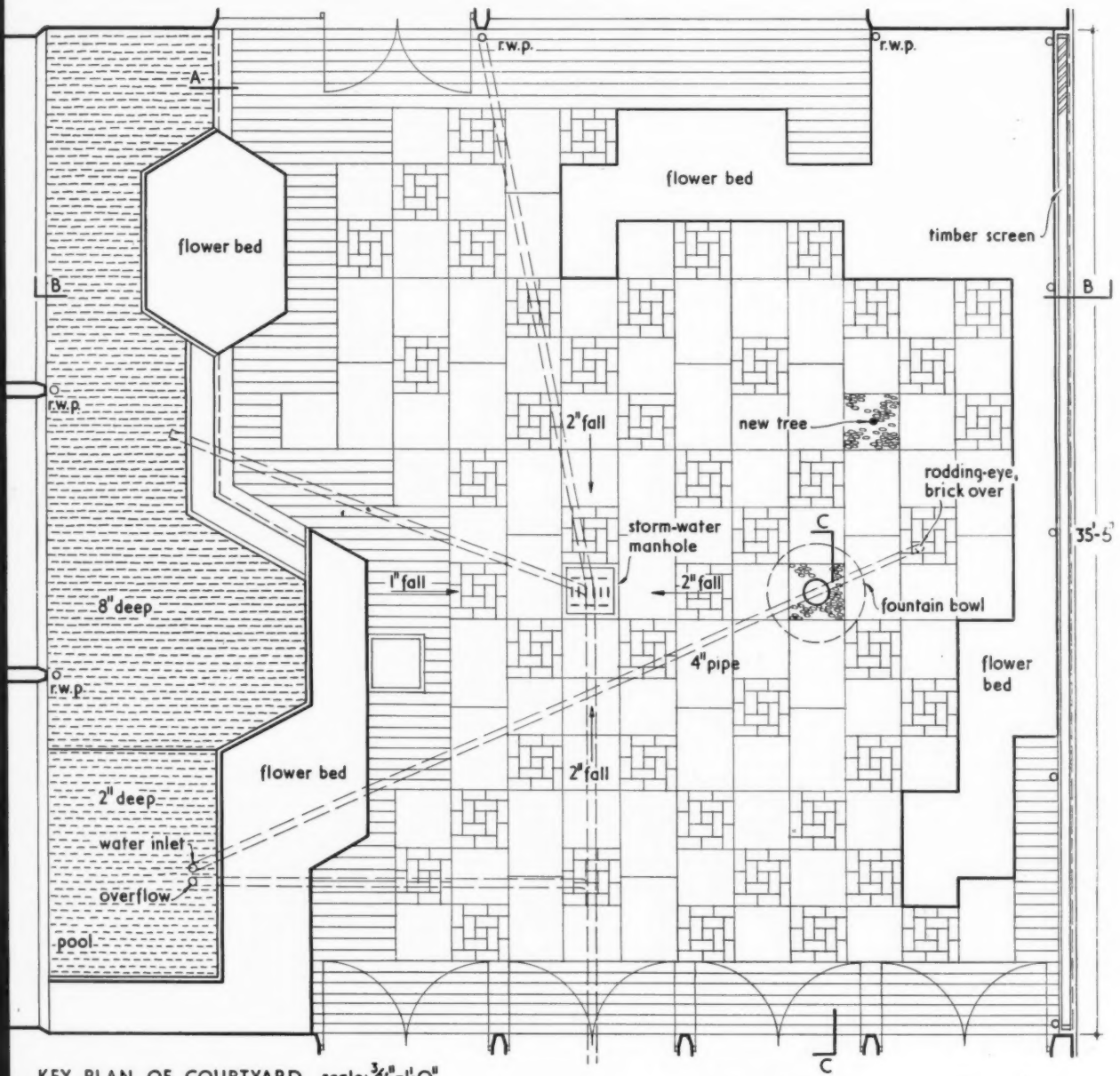
PAVED GARDEN: SCHOOL AT COVENTRY

S. A. W. Johnson-Marshall, chief architect, Architects and Building Branch, M.O.E., in association with D.E.E. Gibson, formerly City Architect, Coventry; Michael Smith, J. E. Toomer, architects-in-charge

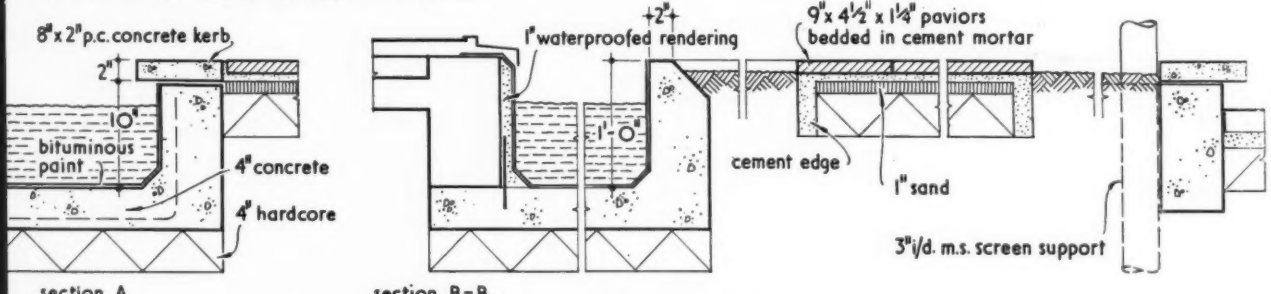
The foundation of the paved area comprises 4-in. hardcore blinded with ashes. Where the paved area abuts a flower bed the hardcore is stopped against a cement edging. The paving slabs were laid first and bedded on sand. The brick paviors which were bedded on a further layer of cement mortar were then laid flush with the top surface of the slabs. A perforated precast concrete slab covers the storm-water manhole in place of the more usual c.i. cover. Access to the rodding eye, terminating the pipe line to the fountain, is by raising an uncemented pavior.

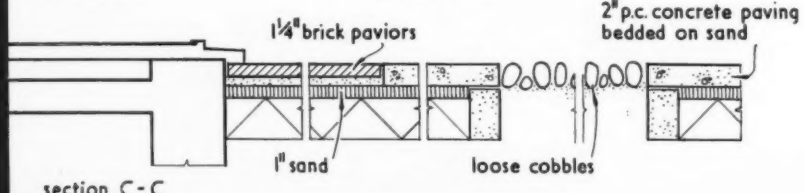
PAVED GARDEN: SCHOOL AT COVENTRY

S. A. W. Johnson-Marshall, chief architect, Architects and Building Branch. M.O.E., in association with D.E.E. Gibson. formerly City Architect, Coventry; Michael Smith, J. E. Toomer, architects-in-charge



KEY PLAN OF COURTYARD. scale: 3/16"=1'-0"





COURTYARD DETAILS. scale 3/4"=1'-0"

WORKING DETAIL **MISCELLANEOUS: 8**

GARDEN SCREEN: SCHOOL AT COVENTRY

S A W. Johnson-Marshall, chief architect, Architects and Building Branch, M.O.E., in association with D. E. E. Gibson, formerly City Architect, Coventry; Michael Smith, J. E. Toomer, architects-in-charge

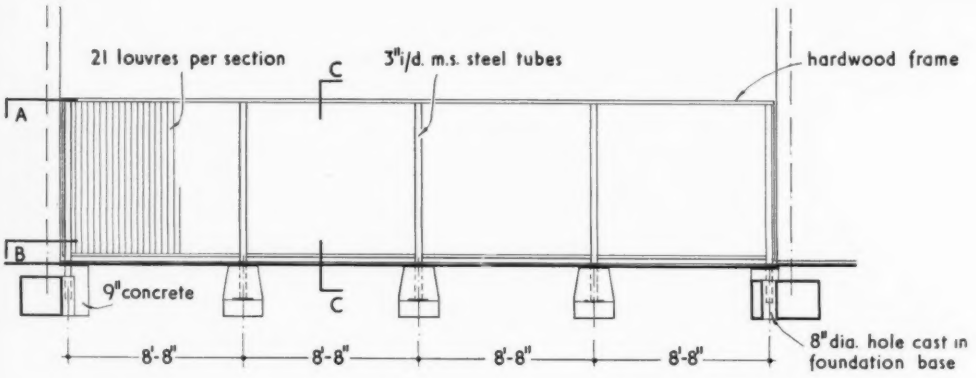
The object of the screen was to provide a visual barrier across the open side of the courtyard which is used as teaching space for the drama hall. The screen is of hardwood and was built of four sections, each comprising a top and bottom rail and 21 slats. The sections are supported on five 3-in. internal dia. m.s. tubes which have been filled with concrete to give added weight and stiffness.

WORKING DETAIL

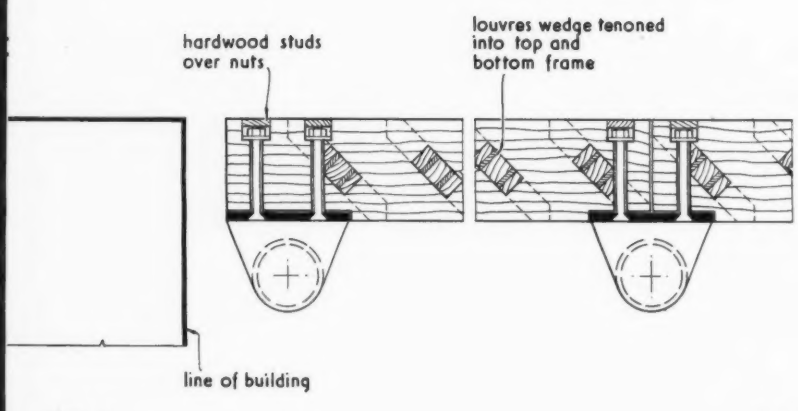
MISCELLANEOUS: 8

GARDEN SCREEN: SCHOOL AT COVENTRY

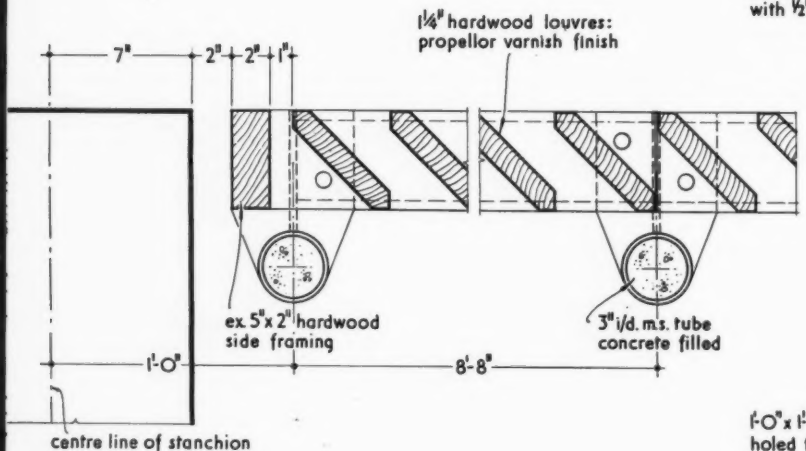
S. A. W. Johnson-Marshall, chief architect, Architects and Building Branch, M.O.E., in association with D. E. E. Gibson, formerly City Architect, Coventry; Michael Smith, J. E. Toomer, architects-in-charge



ELEVATION OF SCREEN FROM COURTYARD scale 1/8" = 1'-0"

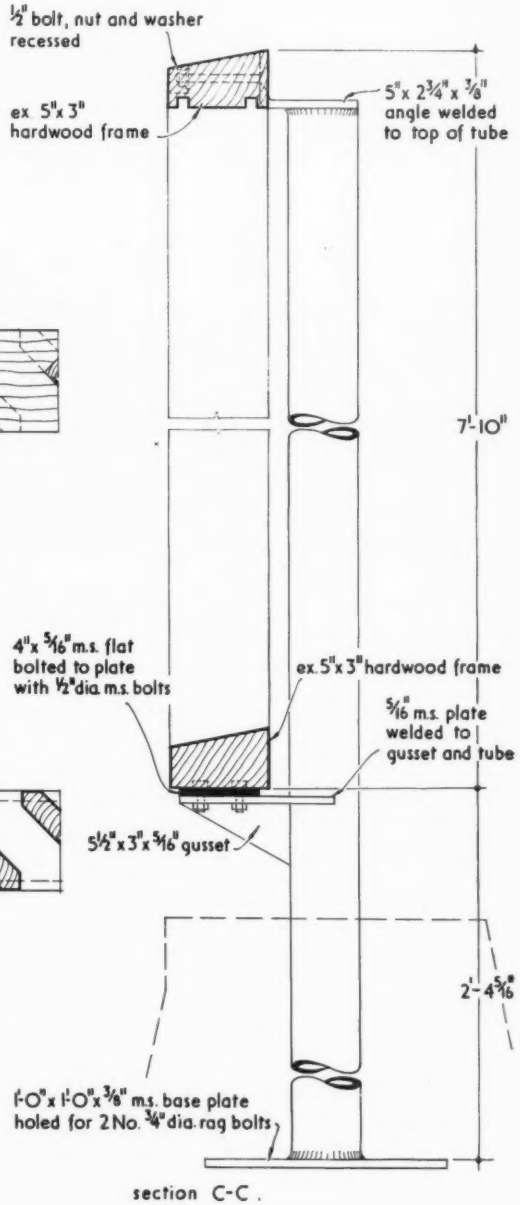


plan A.



plan B.

1/8 F.S. DETAILS.


½" bolt, nut and washer recessed
ex. 5"x 3" hardwood frame
5"x 2¾"x ⅜" angle welded to top of tube
7'-10"
4"x 5/16" m.s. flat bolted to plate with ½"dia. m.s. bolts
ex. 5"x 3" hardwood frame
5/16" m.s. plate welded to gusset and tube
5½"x 3"x 5/16" gusset
2'-4 5/16"
1'-0"x 1'-0"x ⅜" m.s. base plate holed for 2 No. ¾"dia. rag bolts

section C-C.

Drain types	*Location*	*Materials*
Traditional	Throughout	Glazed and socketed

Rainwater disposal type	*Location*	*Materials*	*Comments*
Ext. downpipes	Mainly external	Aluminium	Enable long lengths to be used with minimum no. of socket joints

FIRE

Structural precautions	*Grade of protection*	*Apparatus, sprinklers, etc.*
¾-in. fibrous plaster cover to all structural members	½ hour	Hoses, extinguishers. Hydrants dispersed among blocks
Vermiculite concrete suspended ceilings	1 hour (minimum)	

Planning precautions access for fighting	*Means of escape*
As MOE Bulletin 7	Internal staircases
Separate block planning minimises fire spread	

COLOUR

Paint types	*Where used*	*Colour treatments*
Oil	Generally	Archrome range using Munsell classification
Emulsion	In small areas on external cladding only	Scheme generally in accordance with Building Bulletin 9.

TIME SCHEDULE

Contract Signed	*Work commenced*	*Work completed*	*Type of contract*	*Comments*
July, 1952	August 14, 1952	November 10, 1954	R.I.B.A.	Completion time affected by two unusually wet summers and severe winters.

PLAN ANALYSIS

Summary of accommodation	*First instalment*	*Second instalment*	*Total*
Number of pupils	1,050	600	1,650*
Minimum prescribed teaching area	47,680 sq. ft.	17,000 sq. ft.	64,680 sq. ft.
Places for cost purposes	1,200	450	1,650
Number of form units	35	20	55*
Areas on plan			
Teaching area	55,357 sq. ft.	20,756 sq. ft.	76,113 sq. ft.
Total superficial area	86,742 sq. ft.	32,553 sq. ft.	119,295 sq. ft.
Number of teaching spaces provided	43½	18	61½†

	First instalment			*Complete school*		
Accommodation	*Area*	*% of area*		*Area*	*% of area*	
Teaching	55,357	63·90	69·06	76,113	63·86	69·83
Teaching storage	4,470	5·16		7,114	5·97	
Administration	772	0·89	5·33	816	0·68	4·72
Administration stores	3,850	4·44		4,817	4·04	
Cloaks and sanitary	7,591	8·76		11,689	9·81	
Circulation	10,066	11·62		12,933	10·85	
Kitchen	1,547	1·79	5·23	1,991	1·67	4·79
Boiler house	2,980	3·44		3,713	3·12	
Total	86,633	100·00		119,186	100·00	

* Includes 150 sixth-form pupils (5 form units).
† Includes advanced laboratories, but excludes several rooms where groups of children can be taught.

COST ANALYSIS

No. of form entries	7
No. of places	1,200
Floor area (sq. ft.)	86,742
No. of sq. ft. per place	72·28
Net cost	£281,761
Net cost per place	£234·80
External works	£37,218
Gross cost	£318,979
Gross cost per place	£265·75
Tender date	July, 1952

Analysis of Central Block (blocks 11, 12, 13, 14 and 18 on site plan) *area* 21,586 *sq. ft.*

Element	*Cost per sq. ft.* s. d.
Prelims. and Insurances	3 10·1
Contingencies	1 5·8
Work below ground floor level	3 6·1
External walls and facings	5 5·1
Frame	10 11·9
Upper floor construction	6·7
Staircases	10·9
Roof construction	4 2·1
Roof lights	9·5
Metal windows and external doors	4 9·7
Glazing	9·3
Internal partition and screens	2 1·7
W.C. doors and partitions	1·2
Internal doors	6·1
Ironmongery	3·4
Floor finishes	3 11·6
Wall finishes	9·1
Ceiling finishes	3 1·4
Decorations	2 7·8
Cloakroom fittings	0·9
Fittings	1 6·3
Built-in fittings (gallery)	9·1
External plumbing	1·7
Internal plumbing	1 8·0
Sanitary fittings	4·3
Electrical installation	3 10·5
Heating installation	4 1·8
Drainage	1 4·2
Playgrounds	8·2
Net Cost	65 4·5

COST COMMENTS

The cost analysis of a large comprehensive school comprising separate buildings as at Woodlands, presents a wealth of useful information. For not only can the overall analysis be used in the usual way for comparison with other completed projects when cost planning, but in addition the cost of each separate building within the school is dissected for comparison one with another. It is not possible at present to publish the complete analysis for the seven buildings, although it is hoped to achieve this ambition in due course. With such a yardstick, answers can be found (within the limits of the construction system and site conditions) to such design/economy queries as "What sort of saving, if any, do I make if I build three storeys high in lieu of spreading horizontally?" The cost-sensitive architect will always be glad to have an answer to this problem and the comparisons between building and building are positive since the level of pricing is constant.

We reproduce above the analysis of the largest unit, the central block, which is representative of the whole since it comprises assembly hall, gymnasium, library, drama hall, administrative offices, classrooms, lavatories and stores. In the individual analyses the allocations for preliminaries and insurances, contingencies, drainage and playgrounds are spread *pro rata* to the floor areas, so that each building makes its contribution at the same unit rate.

Examining the analysis shown, this building has, of course, more large span areas in relation to its total area than a complete school would have, and this probably accounts for 10s. 11·9d. for the "frame"—the highest cost of this element yet met with in the AJ school analyses. Work below ground floor level at 3s. 6·1d. is at the other end of the scale and is accounted for by a nearly level site and uncomplicated foundations. The cost of structure is, as shown below, very much in line with other schools shown in these pages.

	Cost p.f.s. s. d.	*Tender Date*
Sheffield ..	34 0·5	March, 1951
Woodlands ..	34 11·9	August, 1952
Barnet ..	34 3·9	September, 1952
Worthing ..	35 6·9	May, 1953

COST OF SERVICES AT WOODLANDS

Element	Gym Block (single storey)	Central Block (part single pt. 2-storey)	Teaching Block 1 (2-storey)	Teaching Block 2 (3-storey)	House Block 1 (single storey)
	s. d.	s. d.	s. d.	s. d.	s. d.
Heating installation ..	5 6·1	4 1·8	6 6·8	5 7·0	7 8·0
Plumbing (internal) ..	1 10·2	1 8·0	1 7·5	1 8·0	2 1·1
Electrical installation ..	2 6·3	3 10·5	3 11·9	3 8·5	3 7·6

The differences in cost per unit of the heating (see above) give rise to thoughts on functions, plan shapes and heights of the various buildings. The high cost of the house block is due probably to kitchen requirements, to the expensive boiler for a small area, and decentralised planning. Reference back to the article on Cost Planning (AJ, July 28, 1955) would remind one that there are other considerations to be borne in mind such as temperature requirements, air changes, roof insulation, etc., which effect the cost of heating, but the important inferences are those mentioned above. The rates for internal plumbing depend, of course, on the number of fittings in the buildings to be compared but for the same reasons as for heating, the house block is expensive. The electrical installation shows no definite trend, except perhaps that the gymnasium with its fewer fittings requires simpler circuits.

It may be noticed that there is an element "gallery" in the cost analysis shown. Where some particular item does not appear to fit conveniently within the liberal confines of the conventional elements, then it is best to make it an element on its own. At Worthing Technical High School, for instance, readers may have noticed that the garden room was kept apart. This happened to be of traditional construction quite distinct from the prefabricated system used throughout the rest of the school and it was therefore thought best to keep its identity separate.

TECHNICAL SECTION

The disadvantages of heating by the conventional gravity hot water system are that the 1-in. and $1\frac{1}{4}$-in. pipes are unsightly if left open to view, and are costly to install if concealed; and that they are slow to respond to regulation and are uneven in performance, giving better results on the flow than on the return circuit. The faults in performance can be overcome by the use of a pump, though this solution has not been much used in domestic work because until recently there have been no suitable pumps on the market. For some time now BCIRA have been working on a system which ought to be particularly suitable for this purpose; it involves the use of a pump powerful enough to allow the reduction of the pipes to $\frac{1}{2}$ in. These are considered to be small enough to run in full view without looking untidy, and they reduce the disturbance of finishes when installed in an existing building. The main technical advantages claimed are that there is no heat loss due to pipes having to run in the roof space or below ground floor, that the system is most susceptible to thermostatic control—which all are agreed is the key to economical heating—and that an even performance is given throughout the circuit. Field and laboratory tests are still going forward. When these are completed (probably early next year) and when the requisite control equipment is generally available "small-pipe forced circulation central heating," as it is called, should be a likely choice for the £4,000 house.

This week's special article

7 PRACTICE
programming for architects

It is part of the Guest Editors (Costs) programme to present, besides their own articles, the ideas and experience of others. Hence they asked the editors of the JOURNAL *to commission a number of contributions on specific subjects. The first of these, which appears below, is by Clive Wooster, A.R.I.B.A., A.M.T.P.I., who describes a method of programming an architect's work which "differs in detail, though not in principle" from that suggested by the Guest Editors in their article "The Architect's Contribution (AJ June 30, p. 885). Clive Wooster has experience of both private and local authority practice, and is at present on the staff of the Architects and Building Branch, MOE. The Guest Editors invite readers' comments on his programming method.*

Enough has been said in the recent articles in the AJ and at the Harrogate conference to show that there is an acknowledged need for an architect to be able to plan and programme his work so that all the various pieces of information can be produced at the right time. It is also acknowledged to be a difficult thing to do. This article describes a method of carrying out work that with experience will lead some way towards meeting the needs that have been expressed.

Here it might be as well to define the word "programme," about which there has arisen much unjustified cynicism. Some experts in building site organization draw a distinction between a "timetable," which is a list of

times set against a list of events, and a "programme," which shows both the relationship in time between one event and another, and the materials, plant, manpower, and duration of time necessary to achieve each event. Timetables are unfortunately often called programmes; and since failure to keep to a timetable (unsupported by a programme) has been a probable and frequent occurrence both in the office and on the site, the idea of programming has become somewhat tarnished. In this article "programming" means the full assessment of time and resources to carry out a job.

A full assessment of time and resources, however, implies a very detailed knowledge of the tasks to be undertaken. In building, this detailed knowledge can be provided by the QS in his quantities and by the builder with his records and experience of previous jobs. Architects' work is not so easily measured, and so a suitable basis for assessment must be sought. The management consultant's technique of finding out what, why, when, how, and how much, in general and in particular, applied to architectural office procedure produces the following view of the work, and indicates how to relate the tasks to the resources. It should be noted that this view differs in detail, though not in principle, with that of the Guest Editors in their article of June 30. (Page 885.)

The Architect's Work

An architect's work, however it is organized, falls into four categories: *management, investigation, design, and instruction. Management* is the linking thread, the directive force. It entails all the administration and organization of the jobs, the drive to keep them going, and the need to make decisions at the right time.

The second kind of work, *investigation,* involves the assembly of all the information about the function of the building (the client's brief); about the site and local conditions; about the possible methods of construction; about probable costs from the QS; and information that will spotlight the major problems.

The third kind of work is *design:* the correlation of information obtained from the investigation; the solving of physical and aesthetic problems, assimilation of specialist advice, and integration of the solutions. It is an extremely fluid process, and involves the production of numerous drawings and sketches. The results are of value only to the architect, because no coherent picture is obvious to anyone else.

The fourth kind of work, *instruction,* is the process of telling the builder how to construct the building. It requires the presentation of information, usually by drawings and written documents, in a way suitable to the QS, to the builder in his office, and to his men on the site. The making of drawings and written documents might be called "preparing instructions" as distinct from giving instructions when the job is under way.

A Rational Pattern

From this brief analysis several important facts are evident, apart from the obvious one that management will set the level of efficiency of the whole job down to the last dab of paint. It is clear that (1) investigation should be largely complete before the design is seriously started, and that (2) design should be complete in all but minor details before the preparation of instructions, i.e., working drawings, are commenced. Departure from this sequence must lead to the familiar troubles of corrections to working drawings and to variation orders. Some overlapping is inevitable, but it should be limited. It is also clear that drawings are made for two reasons; (1) to enable a building to be conceived in whole and in every part, which means a large number of drawings but of which many may be only rough sketches of isolated pieces of work; and (2) to instruct the builder, which means that drawings should be few in number with well considered information clearly shown and well related. In architects' offices these separate operations and purposes are often confused with each other, and are rarely carried out in the best sequence. It is not uncommon for the ¼-in. scale drawings to be completed in ink before details have been started, and all aspects have been thoroughly worked out; or for plenty of drawings to be made for instructing the builder, but few to clarify the architect's mind as to what all parts of the building will look like. This leads to late changes of mind on the job.

PLAN OF WORK

Approach

To simplify programming and control, the sources of trouble discussed above must be avoided by making a plan of work. The plan will not differ much from job to job but the effort put into the various parts of the plan will depend upon the nature of each project. There will be three phases: (1) investigation, (2) design, (3) working drawings. Each phase must be broken down into aspects or tasks for allocation among several members of a team, and so that each task can be put ultimately in the proper place in its phase. As will be seen later this also helps in timing the programme and controlling the work in the office.

If Mr. Aubrey Basildon-Jones, A.R.I.B.A., *reader of the AJ and enthusiastic trier of anything once, was now asked by Mr. Smart, a friend of Mr. Gross, to act for him in the building of an office project of about the same size as the one for Mr. Gross (see AJ Jan. 27 and Feb. 3)*, he might first roughly sketch his plan of work like this:*

Investigation;
Design;
Working drawings;
Bills and Tender;
Start on site.

First Phase—Investigation

Here the amount of work will depend on the type of job and whether the client wants a run of the mill solution or the results of fresh thinking. Each field of inquiry can be considered as one aspect of investigation. The check list technique as described by the Guest Editors (AJ, June 30) is quite useful throughout the phase to ensure that each aspect is adequately explored so that no important point will first appear late in the job.

After the early briefing discussions, having assured himself that there were no particularly unusual requirements and that it was to be virtually a run of the mill job, A. B.-J. would proceed with the investigation; with himself and one assistant allowing, say, one month for part-time work to find out about; or do some work on;

(a) Clients requirements in detail. (Brief).
(b) Site; including trial holes and any limiting conditions.
(c) Services.
(d) Local building resources.
(e) T. P. Authority's view in principle.
(f) Other concerned authorities' views.
(g) Preliminary planning studies.
(h) Preliminary structural studies.
(i) Preliminary consideration of materials and finishes.
(j) Preliminary discussions with QS.
(k) Anything else that might arise from the inquiries made under (a)-(j).
(l) Plan of work
(m) Draft programme.

Local practice has already put A. B.-J. in possession of some of the information, so as soon as he has collected the important parts of the remainder, he can complete his plan of work for the design phase.

Second Phase—Design

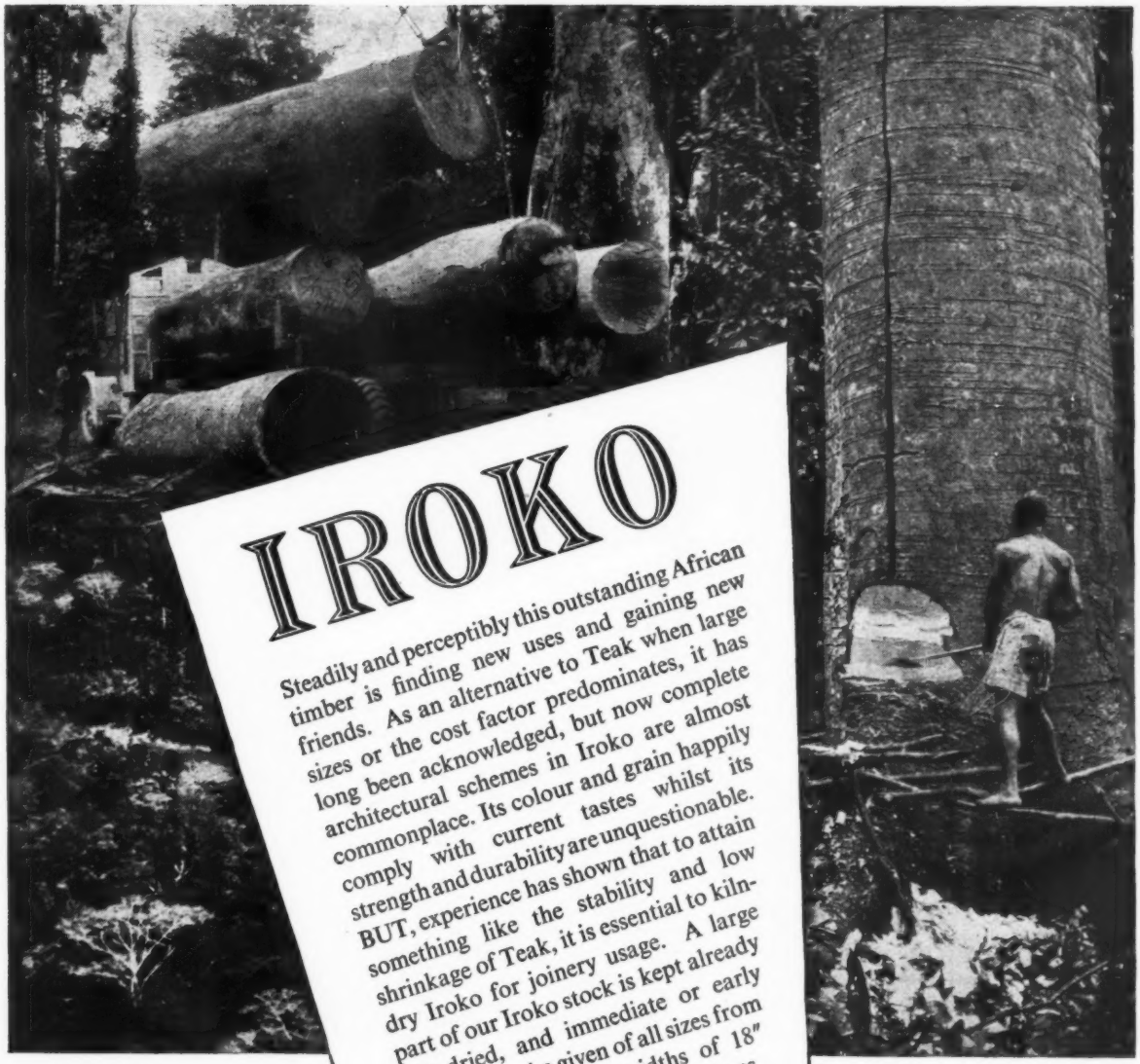
The aspects most suitable for design will depend on the job, but will generally fall under such headings as plans and elevations; windows; structure; drainage; etc. At the same time all these aspects have to be related to each other in one overall aspect that might be termed "integration." The breaking down into aspects is a sound principle commonly adopted, since it enables the architect to focus his full attention upon one matter at a time, and ensures that where a detail or process on the job can be standardized, the opportunity is more likely to be grasped. It introduces the danger of contradiction or omission, but this is not serious as long as there is some checking procedure. Space does not permit the discussion of these matters here. One way to carry out the last aspect and achieve "integration" is to make a series of sketches of all floor spaces and internal elevations, with some sections, gathering together in their proper relationships everything that has been designed under the headings of the other aspects.

A. B.-J. recalls some of the jobs he has done and produces a list of design aspects as in Fig. 1,b *Cols.* 1 *and* 2. (*Page* 505).

Third Phase—Preparation of Instructions

In the preparation of instructions, i.e., working drawings, etc., the work can again be broken down into aspects, but each should

* These two articles by the Guest Editors told the fictitious story of an office building contract—from clients' instructions to completion. Aubrey Basildon-Jones was the architect, Herbert Gross the client and Bill Price the quantity surveyor. The story was given to illustrate the cost problem as we encounter it in daily work.



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be an aspect or stage of work from the builder's point of view. It should represent a further breakdown from the three main stages of work on the site; work below ground; superstructure; completion. A building aspect may be two or more design aspects telescoped together, e.g., foundations and drainage; or it may cut across several design aspects as in a series of details showing the complete fitting out of special rooms. If working drawings are produced as a number of closely related series, one for each building aspect, and the aspects be determined according to the order of work on the job, the relevant information for each stage is more likely to be clearly shown and the irrelevant omitted. The best arrangement of aspects will depend to a large extent on the design, and when it is known, the programming of site operations.

A. B.-J. decides on the building aspects as in Fig. 1,c. *Note the difference as compared with design aspects.*

THE PROGRAMME

Compiling the Programme

The full programming of the job obviously cannot be undertaken until the investigation phase is well under way, and the extent and number of the most serious problems is known. When this has been ascertained, a complete list of the aspects or tasks can be determined as described above, and the programming can proceed.

Against each of the aspects of investigation that remains to be done, and each of the aspects of design and W.Ds. a time must be set; this time will be the full working time that one architect of the team would require to complete the task. The time set down should be partly an estimate (based on experience, the nature of the job and the task) and partly a judgment of the time that should be allowed in the circumstances. The times for many tasks will be relatively easy to assess; others will present more difficulty. If for some reason the amount of work involved in one aspect is quite unpredictable, a good factor of safety should, of course, be allowed. The fixing of these times is of great importance. The questions that must be answered in the programmer's mind are; for investigation aspects: how much time is it worth spending on a search for information? for design aspects: how much time is necessary to solve the problems and achieve a reasonable standard of refinement? for working drawing aspects: how much time is necessary to give a sufficiently clear idea of the job to the Q.S. and the builder?

The sum of these times will give the total estimated working time required, on a much better foundation than the usual overall guess, and as will be seen later, the reasonable distribution of the overall working time among all the numerous tasks enables progress to be readily checked.

A. B.-J. recalls as well as he can from memory and from diaries the time that was spent on various parts of Gross's job, and produces a list of times for aspects as shown in Fig. 1, *Col.* 3. *He finds that the total time amounts to* 336 *man/days.*

Fig. 1. *Basildon-Jones' estimate of time needed for Mr. Smart's office block up to the preparation of working drawings. "Days" in col.* 3 *represent man-days.*

LIST OF ASPECTS.

Col. 1 No.	Col. 2 ASPECT	Col. 3 DAYS	Col. 4 PRIORITIES 1.	2.	3.	4.
(a)	INVESTIGATION					
-	All Aspects	44				
(b)	DESIGN					
1.	Plans and Elevations	32	x			
2.	Site Works.	4				x
3.	Foundations	8			x	
4.	Drainage	8			x	
5.	Structure (Frame, Cladding & Roof)	32	x			
6.	Windows, rooflight & doors	16	x			
7.	Partitions	4		x		
8.	Water Services, sanitation & plumbing	6			x	
9.	Electricity & Gas	12			x	
10.	Heating	12		x		
11.	Ceilings	12			x	
12.	Wall Finishes	4			x	
13.	Floor Finishes	6			x	
14.	Equipment & fittings	8			x	
15.	Room Drawings	32				x
16.	General. (Programming, meetings, etc.)	16				
	Total for Design	212				
(c)	W.D.ASPECTS					
1.	Key Plans, elevations, etc.	8	Priorities to suit Q.S.			
2.	Site layout and drainage.	4				
3.	Foundations and drainage.	4				
4.	Structure. (Fully dimensioned layout, sections & details)	16				
5.	Windows, doors, etc.	8				
6.	All service runs and heating.	8				
7.	All service and heating details	8				
8.	Fittings and finishes, details.	8				
9.	Room details	16				
	Total for W.Ds.	80				
	Total for all aspects	336				

Allotment of Tasks

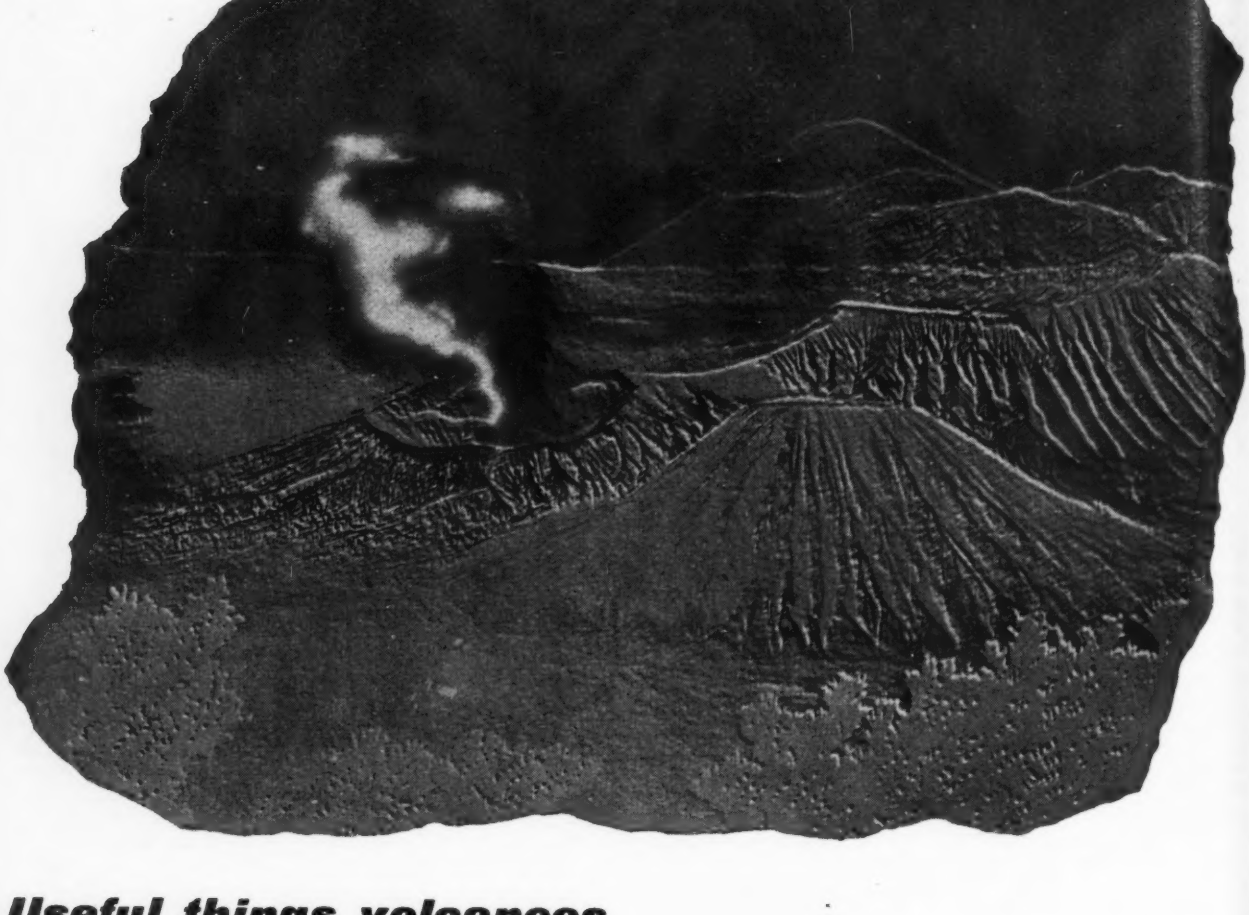
The next stage is to assess the priority of all the aspects in their respective phases, and to allocate the aspects or tasks among the members of the team according to priority of task, and the abilities and interests of the members. It is important that priorities are decided and maintained so that delays through lack of information about related aspects do not occur. The first priorities will be the unknowns, and those aspects upon which other aspects depend. In the design phase, while the general plan form is of obvious priority, constructional method will have a considerable effect on the ultimate plan, and together they will have a dominating influence on the rest of the work. They will be modified only in detail on account of other aspects. Hence, window detailing must await the major decisions on plan and structure. Alternatively the use of new materials may present numerous problems that must be solved before any other detailing can usefully be done. These interlocking aspects must be worked into their proper places so that no task is held up for want of information from another and so that all members of the team are purposefully employed all the time.

This work is a fairly complicated piece of juggling, and is perhaps best carried out with the aid of diagrams. Each member of the team has his tasks drawn to a time scale in sequence according to the priority already determined. When these sequences are placed side by side and compared, the priority pattern for the whole job can be checked and modifications be made as necessary. It will often be found that certain aspects have to be carried out in at least two parts to allow for the interaction between two or more aspects to be worked out, or to allow specialists to prepare their designs before the architect can incorporate the results. It may not be feasible for all the team to start at once. But it is important that all the major investigation is finished at once (to avoid delay when new facts come to light after design has commenced), and that all design work is finished at once (to avoid alterations after working drawings have been commenced). It is important to ensure that no decisions are changed after the beginning of working drawings. A buffer period of a week between the end of the design phase and the beginning of working drawings is useful to allow time for last minute changes to be made in the light of the whole design.

A.B.-J. allocates priorities as in Fig. 1, *Col.* 4, *assuming a team of three. He plots the tasks according to priorities and the abilities of the men and finds that the work can be arranged to be done in* 132 *working days, as in Fig.* 2. *Fig.* 3 *shows part of a diagram he used to check the interrelation of design aspects.*

Timing

These diagrams show clearly that because of priorities and key tasks there is a limit to the size of the team that could be used at different stages of the job, and that there is therefore an actual minimum working time that the job will take to complete. The team's overall working time can now be seen; but what is required is calendar time, and so some allowance must be made for holidays, for sick leave, and for any other duties of the team members; the whole being put in the form of calendar weeks. The



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period for each aspect and its calendar timing must be arranged accordingly. If, as sometimes happens, one member of the team can put in relatively little time compared with the others, some tasks will be reallocated to ensure even finishing dates. The last aspect of design, integration, concerns all team members and the distribution of this work can be used to tidy up the finishing times.

A.B.-J. finds that although his office works five days a week, holidays, sickness, and looking after odd jobs makes an effective working week on an average of only about four days. He thus finds that all the work to be done before the job goes to tender will occupy about eighty-four man/calendar weeks. He puts week numbers against the chart as in Fig. 2. None of his team is heavily engaged on any other work so no differential allowances have to be made, and the calendar time works out as thirty-three weeks for the whole job.

Over-all Time

If the estimate of calendar time works out longer than was at first expected it probably means that the expectations as usual were optimistic. If the time works out to more than client will allow, action must be taken; to programme for more man-power, or persuade the client to agree to a longer time, or shorten to some extent the amount of time to be spent on the various aspects and therefore to lower the standards of design aimed at. This lower standard may be in the form of less information for the builder with all the risks that that entails. It may mean the use of stock solutions that are not quite apt; or the acceptance of planning and detailing that have not been much refined. The client could be informed that one or all of these alternatives will be forced on the architect by shortage of time. The architect with his plan of work and detailed programme in front of him can speak with full confidence.

A.B.-J. checks with Bill Price, the QS, that the time required for billing will be six weeks as before, to which Bill Price replies yes, so long as he has good information and not all bits and pieces as in the case of Gross's job. Bill also agrees that four weeks for tender and two weeks to start work should be adequate provided that the contractors are asked beforehand if they wish to tender. A. B.-J. completes the timetable which appears as in Fig. 4, and with a preliminary scheme goes along with his programme and figures to an interview with Smart. Smart is a business man who, though he does not understand such techniques himself, nevertheless employs accountants and statisticians who do use them with the excellent results shown by the annual balance sheet. He is therefore impressed with A. B.-J.'s arguments and calculations and after some resistance, for he is impatient to get started, finally agrees to a timetable as shown in Fig. 5. Smart looks at the preliminary sketches, is generally satisfied, and asks A. B.-J. to a meeting with all the directors in a fortnight's time, to put the scheme forward formally, with an estimate of cost. Smart is pleased because he has knocked five weeks off the time his architect first said he needed; A. B.-J. is pleased because he has gained three months on the time Smart originally suggested. He knows from his preliminary programme, however, that to meet the date he will have to find another assistant, and there may have to be some overtime put in during the first few weeks of the design phase to clear the planning and construction so that there will be a straight run of work.

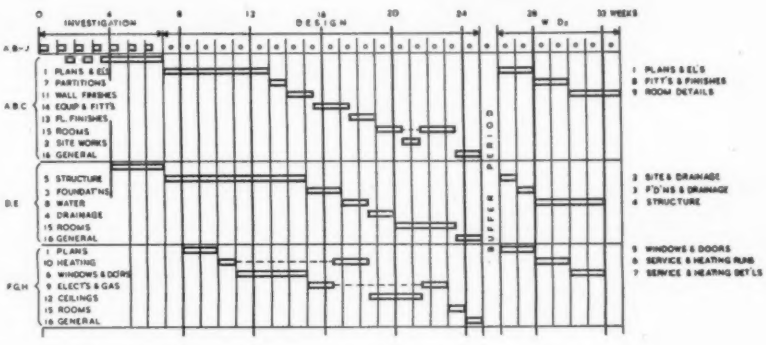
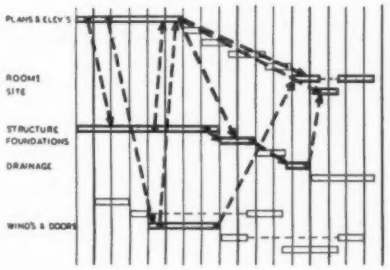


Fig. 2 (above). Basildon-Jones' preliminary programme of office work, based on the table in Fig. 1. Note the "buffer period" between the conclusion of design and the beginning of working drawings. Fig. 3 (right). Check on the timing of certain related key aspects of the work



IMPLICATIONS OF PROGRAMMING

The effect on design

The possibility of controlling the time that he spends on a job brings the architect face to face with the fact that a building can be designed only to the value of money *and time* that is spent on it. Where time is short, quality must suffer, and in dealing with a client, a well worked out programme in which the architect has confidence, has great value. There need be little doubt in the client's mind of how much time the job will take, or of what it is likely to suffer if the time allowed is too short. And if, nevertheless, a limited time is imposed, the architect will be in a position to ensure that the lack of time is spread satisfactorily and does not all fall on the details of finishes, and the preparation of instructions for the builder, with subsequent lack of control on form, quality, and cost.

Where sufficient time has been allowed he can direct the energies of his team into the course he wishes to follow; towards functional and aesthetic performance; speed of erection; or economy; or to a combination of all three as far as time allows, or indeed in any direction that appears to meet the requirements best. He can satisfy himself and his client that to achieve a high standard in all directions will take a great deal of time, and he can say how much time.

A. B.-J. attends to the task of revising the programme. He now knows that his client is very interested in speed, in economy, and in a building that gives an impression of slick business efficiency; that he has no strong views on planning and his organiza-

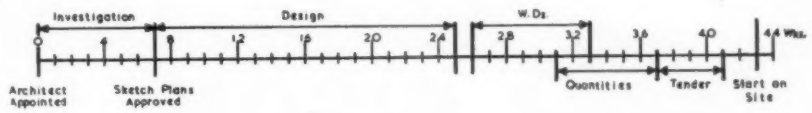
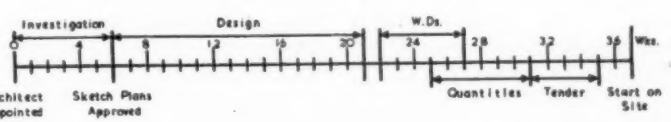


Fig. 4 (above). Basildon-Jones' timetable of office work based on the programme in Fig. 2.

Fig. 5 (below). The timetable as finally agreed with Mr. Smart.



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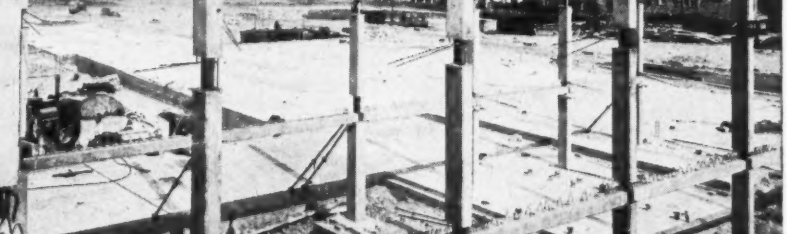

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tion does not demand unusual solutions. So A. B.-J. decides to waste no time in seeking special planning effects but to adopt a straightforward solution. He will concentrate on producing a simple structure and will take particular care over the elevations both as to form and detail; he will take care over the internal finishings to satisfy his client's wish for slickness, and to satisfy his own wish to produce a building that will be a pleasant place to work in. He will accept standard solutions for services, heating and lighting.

Effects on office working

A sound programme gives the architect a very good idea of the manpower he will need for some time ahead, and gives him data upon which to plan the use of manpower. Records of time spent if truly kept are of great use in the programming of other jobs and for general use in management. To be of use, a programme requires to be rigorously observed and this implies a strict discipline, essentially a self-discipline on the part of the team members, to avoid pursuing refinements for which there is no time in the conditions obtaining. This is a harsh fact to face. As has been said, buildings can be produced only to the value of money and time spent on them. An architect does his profession no service by designing a superficially delightful building, but erecting a botched and costly one. A less delightful conception well executed and finished will generally appear better value for money to the client and will be less criticized by those who see and use the building. The idea of programming design work may be obnoxious to some conscientious architects, who will feel that design cannot be timetabled. But if time must be accepted as a limitation it is surely best to ensure that what time there is is carefully distributed between the conception, the structure, the finishes and the instructions to the builder; a well-balanced job of reasonable quality will then result. A little work stinted in comparison with the remainder can cause a nuisance out of all proportion to its value.

A. B.-J. discusses the job with his prospective team members to get their views on working to programme and on reasonable times to be allowed for the work on each aspect. He finds a certain amount of resistance to the idea, but when pressed it seems that his assistants are much more optimistic than he is about the time that will be needed, so his suggested timings stay very much as they were, and with some reserve, it is agreed to give programming a trial. The final programme appears as in Fig. 6.

A. B.-J. is of course in close touch with Bill Price about costs. The plans and a provisional estimate of £50,000 are approved, apart from one or two minor adjustments to planning, at Smart's board meeting at the beginning of November. A. B.-J. now puts dates to his programme and timetable and finds that the job must be out to tender by the last week of April, and should start at the beginning of June. He is intrigued to notice on looking back at Gross's job, that June was the time when that job really got cracking, and that the previous November had been the time when Gross's board had approved the plans generally.

The final programme allows for a fourth member of the team; it is shorter in consequence and the emphasis of time has shifted to allow for greater consideration of certain aspects.

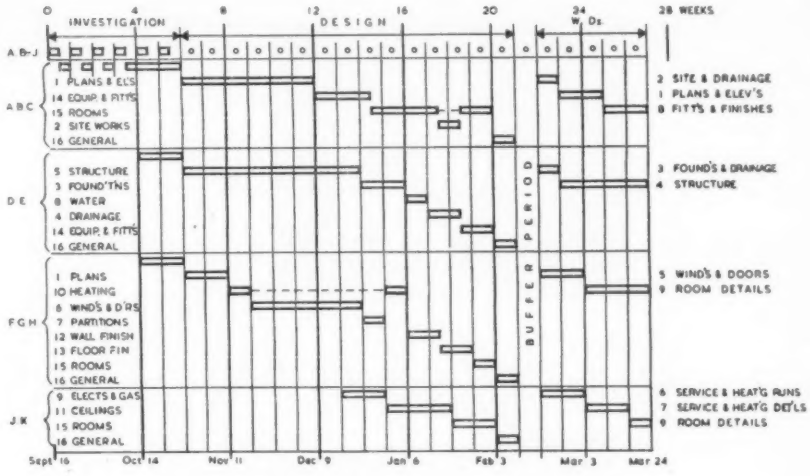

Fig. 6. Final programme, based on Basildon-Jones' preliminary programme (Fig. 2) but modified to meet the timetable exacted by Mr. Smart (Fig. 5).

The Programme for Control

The showing of the total time required to prepare for a job is only part of the function of an office programme. It must also act as a datum from which to judge reasonable progress. If the amount of time actually spent on each aspect by team members is recorded, and, together with estimated progress, is checked at regular intervals against the programme, a clear indication will be given of the state of the job. Instead of a long period of easy-going optimism, culminating in a major panic, the series of minor target dates conscientiously worked to will produce a series of minor efforts *and* decisions; there need be no major panic. It would be unreal to suggest however that architectural work can be done in solid chunks as the programme indicates. What is shown on the programme is the amount of time allowed to complete each aspect and the date when the bulk of it should be complete. All kinds of situations arise which necessitate the work on one aspect being dealt with in several attacks. The system must therefore be capable of recording all short spells of work and breaks in continuity and still measure progress against programme.

DAILY RECORD OF TIME SPENT

Note Time to be recorded in quarter-days e.g. 2H, 3/4 etc Aspects to be noted by number as in programme

JOB Office for Smart Ltd
PERIOD Fortnight 5

Archt.	A B C		D E		F G H		J K	
Date	Time	Aspect	Time	Aspect	Time	Aspect	Time	Aspect
Dec 26								
27	3/4	D14	3/4	D3	3/4	D7	3/4	D9
28	1/4 3/4	9 D10	1/4	D3	1/4	D10	1/4	D9
29	1/4	D14	1/4 3/4	D2 D3	1/4 3/4	D10	1/4 3/4	Comp

Fig. 7 (above). Daily record sheet for the four assistants. Fig. 8 (below). Weekly abstract of time spent on each design aspect.

TIME SPENT ON ASPECTS

(Weekly Abstract from Daily Record of Time Spent)

Note All time recorded in days
Allow 4 days per calendar week

JOB Office for Smart Ltd
ASPECTS ... 7 ... 12

Aspects	7			8			9			10			11			12		
Time Allowed	4			4			8			8			14			6		
Date	Arc	Tim	Tot	Arc	Tim	Tot	Arc	Tim	Tot	Arc	Tim	Tot	Arc	Tim	Tot	Arc	Tim	Tot
B/F			3						5¾			3¾			2			
30/12	Mon	1½		DE	¼		JK	2¼		Mon	1¼							
			4½			¼			8			5			2			

The system adopted should be flexible enough to record the facts with reasonable accuracy. Recording by days is probably not sensitive enough to meet the actual activities of any man in the office. The writer has found that ¼ day, *i.e.* about 1¾ hours, is a satisfactory unit of time. This can record with fair accuracy most short spells of work, meetings, interviews with specialists, and group discussions on interrelated aspects. Fig. 7 shows an example of a daily record sheet with work by aspect and by each member of the team recorded in ¼ days. Every week the totals for work on each aspect are transferred to a weekly record sheet as in Fig. 8 where running totals of time spent on each aspect appear and can be compared with the working time allowed in the programme. This information must be developed into a progress check to show the progress on the job as a whole.

A progress check can be prepared weekly, fortnightly, or monthly according to the relative speed of the job in the office, to show: (*a*) estimated days required to complete each aspect; (*b*) days remaining to complete each aspect according to programme. When figures for (*a*) and (*b*) respectively for all aspects are totalled and compared the difference will show the overall state of the work in man/days behind or ahead of programme. This gives quantitive indication of the time that must be saved or may be additionally spent. The weekly record of work done can give an indication of how much additional man-

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power is needed to pick up time. Fig. 9 shows a progress check set out.

The conscientious working to target dates, the winding up of interesting but relatively unimportant excursions in design and refinement when the target date arrives, will be possible only if the targets set down have the confidence of the team members; hence the importance of setting realistic times for the work on each aspect. The programming procedure can be used whether the job is one where the problems and some solutions are known, as for example in housing or small lettable factory buildings, or whether the problem is quite unknown as in the design of an interplanetary travel station. The difference lies only in the number and magnitude of the unknowns, and the consequent differences of time and factors of safety that must be allowed. Control is equally possible.

The reason for the contemporary need for this sort of control of architects work has been fully dealt with elsewhere. It amounts briefly to the fact that methods and tempo of building are not what they were. Such a technique for control is still unnecessary to any architect who is engaged on a series of wholly similar buildings with a builder he knows; experience enables him to re-use old work and to judge to a nicety the time that any new ground will take to break. The full procedure suggested here is only appropriate to a one-off job or to the early numbers of a series. As the experience of a certain type of job increases so can the control arrangements be curtailed.

The method described here may appear too complex for general use, but in practice it takes up little time. Once the method is clearly in mind, the time spent on it will be about one day or less for preparing the initial programme, five minutes each day for daily recording, ten minutes each week for weekly recording, and perhaps half an hour for preparing and considering each periodical progress check. On recording, it is probably best to have one person only responsible for all recording and making out the progress checks, rather than to rely on individuals doing it each for their own work. In this way entries are less likely to be forgotten, and it is possible for one person always to have a clear picture of the progress being made. It is not necessary to account for all office time, because even in the best-regulated and keenest offices, some time cannot easily be accounted for. A need to produce an apparently correct total will produce false entries for individual aspects. All that is required is the record of time spent on a particular task and not how the whole day was spent. Various cross checks can be made on the records from time to time to see that the arithmetic is correct, but tracing minor errors need not be made a fetish; the accuracy of the whole affair is of too low an order.

A. B.-J.'s second assistant, Cogswell, has a particular interest in production engineering and work study ever since he worked on a factory job in co-operation with an industrial consultant, and he volunteers to keep all the progress records, i.e., the daily record and the weekly record as shown in Figs. 7 and 8. It is decided to make progress checks every fortnight, commencing at the beginning of the design phase. Fig. 9 shows the progress check as it might be at the end of the fifth fortnight. It will be noted that some work that should have been started has been neglected, but other work has been started before its programme time. These divergences are not serious if they do not get out of hand, or cause hold-ups on other aspects. Their overall effects are summed up in the totals of days required and days available. This check shows the work to be 14 man/days behind, i.e., 3½ days' work for the whole team. It may be decided, since seven weeks of the design phase still remain, for each member to work 3 hours overtime each week until the time is picked up, and to reduce the work on ceilings by farming some of it out to a specialist firm instead of designing it all themselves. At the end of the design phase, however, they may still find they are two or three days behind, because their estimate of work still to be done on several aspects has continually been too optimistic; but the " buffer " time of a week between design and W.D. phases, which was provided to allow for final decisions to be taken and for all the loose ends to be tied up, takes care of the lag, because few decisions remain to be made, and there are remarkably few loose ends.

Working drawings go more easily than was expected because each member of the team finds he has all the information immediately to hand and there are few details and dimensions that do not click into place like clockwork.

PROGRESS CHECK

JOB Smart's Ltd. PHASE Design PERIOD Fortnight 5

(a) ASPECT	(b) TIME SPENT (DAYS)	(c) ESTIMATED COMPLETION (%)	(d) ESTIMATED TIME REQ'D TO COMPLETE (DAYS)	(e) TIME PROGRAMMED TO DATE (DAYS)	(f) TOTAL TIME PROGRAMMED (DAYS)	(g) TIME AVAILABLE IN PROG. (DAYS)
1. Plans and Elevations	34	95	1½	32	32	-
2. Site Works	-	-	-	-	-	-
3. Foundations	6	100	-	8	8	-
4. Drainage	1	20	4	-	6	6
5. Structure	28	95	1½	32	32	-
6. Windows, Roof Lights & doors	22	100	-	20	20	-
7. Partitions	4½	100	-	-	4	4
8. Water, etc.	¼	-	4	-	-	-
9. Electricity & gas	8	90	1	8	8	-
10. Heating	5	60	4	8	8	-
11. Ceilings	2	10	18	4	12	8
12. Wall Finishes	-	-	-	-	-	-
13. Floor Finishes	-	-	-	-	-	-
14. Equipment & Fittings	11	100	-	10	10	-
15. Room Drawings	2½	10	31	6	32	26
16. General	9	50	9	-	16	16
			74			60

Difference: (d) - (g) 14 days delay.

Note. Only those aspects that have been commenced or should have been commenced need be entered up. The figures for other aspects will automatically balance out.

Fig. 9. Basildon-Jones' progress check at the end of the fifth fortnight

Implications of Planning and Programming on Job Management

Other implications of running a job accurately to a plan and programme are that QS can have completed and well integrated drawings; he can point out any omissions, obscurities or contradictions that he finds, and the drawings can easily be amended to agree with the bills, before they are issued. The builder can have drawings as near perfect as an architect is likely to produce them in this world; they can be carefully arranged, considered, and edited so that the instructions are clear, concise and unequivocal. At the same time the architect will have a bottom drawer full of design drawings and sketches, of details that were not essential to show the builder at the time of tender, but which had to be studied before working drawings were finalised. These may later be put into proper form and issued as supplementary drawings, but they will not entail the risk that supplementaries sometimes do of constituting variations, since the W.Ds. were based upon them. Because there has been no undue haste the number of variation orders necessary through error or omission should be minimal. The number of variations through architects change of mind can still be legion, but are less likely because there will have been opportunity to bring about a satisfactory agreement between various parts of the design prior to the making of W.Ds. Variations due to clients change of mind will be limited if the architect ensured that he had a good briefing, and obtained approvals at appropriate times. If, notwithstanding these precautions, variations are suggested, a prompt report of the additional cost (builders costs and architects fees) and additional time required for the contract may act as a deterrent. This is less possible if the architect himself is frequently initiating V.Os.

Bill Price is very well pleased with the drawings and information that he is given, and the tender documents go out to the builders at the scheduled time.

Full drawings, well produced and at the right time cannot work miracles, they can only help to do so. No more need be said of this story except that few modifications were made during the running of the job, the contractor was never able to plead lack of information, and the total cost of the project was not too dissimilar from the contract sum.

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Announcements

Messrs. H. S. Goodhart-Rendel & Partners have changed their name to Goodhart-Rendel, Broadbent & Curtis.

Messrs. Lionel Brett, F.R.I.B.A., Kenneth Boyd, A.R.I.B.A., and Peter Bosanquet, A.R.I.B.A., are now working in partnership in London and at Watlington. Their London address is 16, Brendon Street, W.1 (telephone number PADdington 9309), and their Watlington address is Watlington Park, Oxford (Watlington 140).

Mr. H. Owen Luder, A.R.I.B.A., is continuing his private practice from his new address at 78, Herne Hill Road, S.E.24, telephone number unchanged at Brixton 7177.

Mr. H. G. Hunt, A.R.I.B.A., has transferred his office to The Ingles, Hawkhurst, Kent, temporary telephone number 2103.

Miss Nadine Beddington, A.R.I.B.A., has taken up an appointment as Advisory Architect to Messrs. Freeman Hardy & Willis Ltd., and will be glad to receive trade literature at 68, Mount Street, W.1 (telephone GROsvenor 7211).

Mr. J. B. E. Moreton, B.ARCH., A.R.I.B.A., A.I.I.A., has joined Messrs. D. Mervyn Edwards, Chartered Architect and Surveyor, as a partner and the new title of the firm is D. Mervyn Edwards & Moreton, L/A.R.I.B.A., A.I.I.A., 5, Lower Brook Street, Oswestry, Shropshire.

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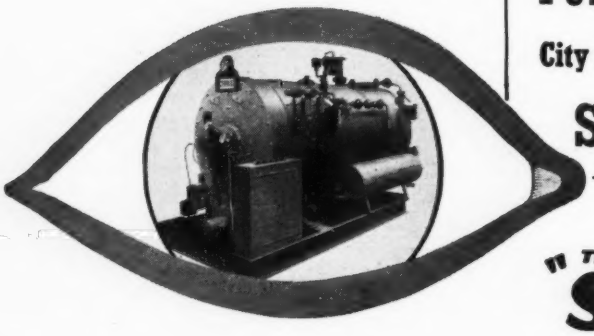

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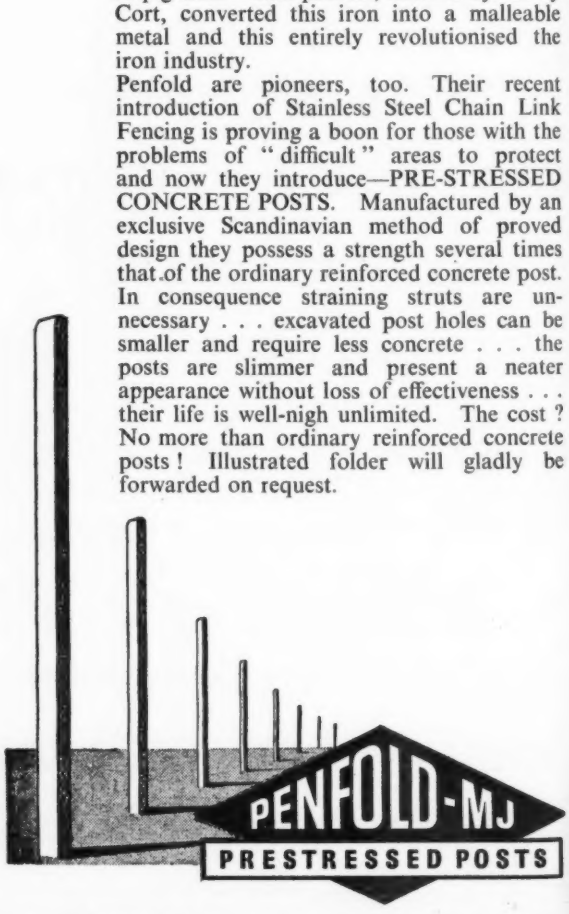

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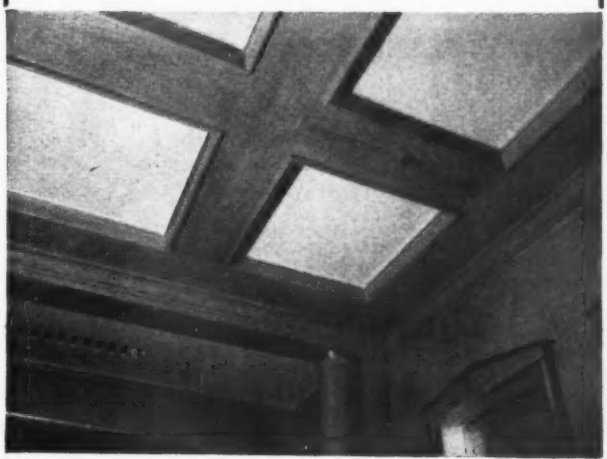

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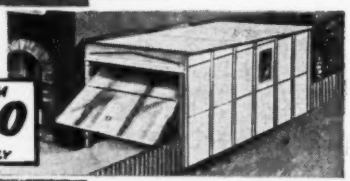

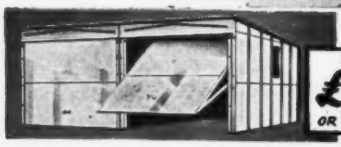

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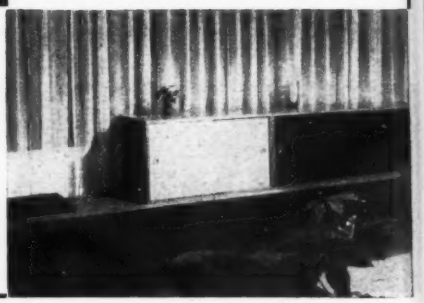

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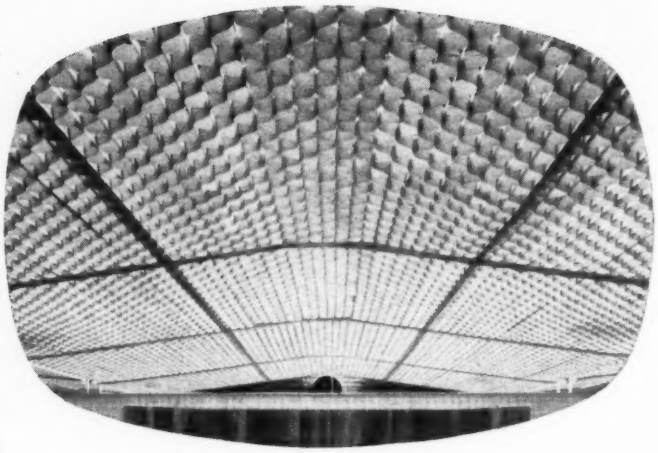

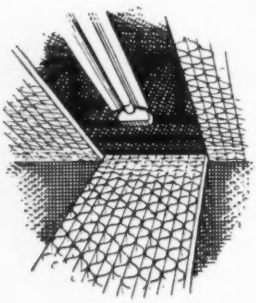

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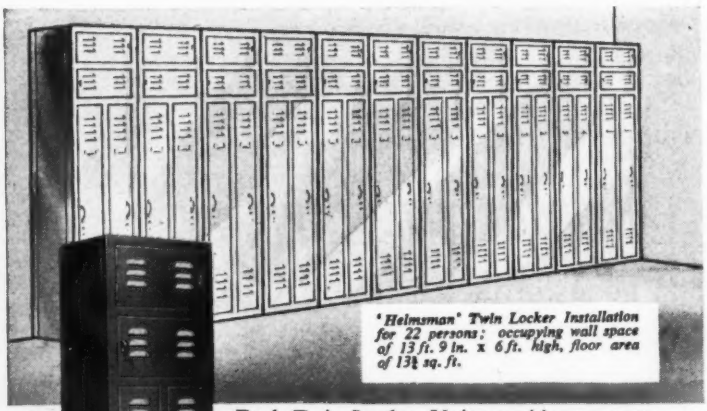

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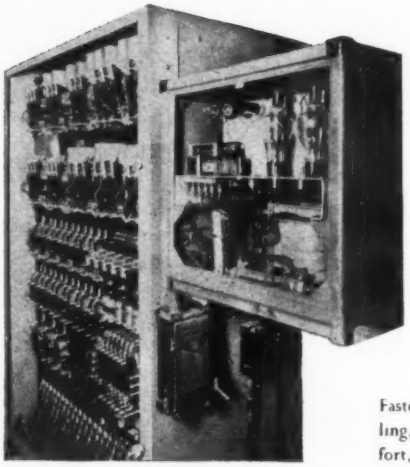

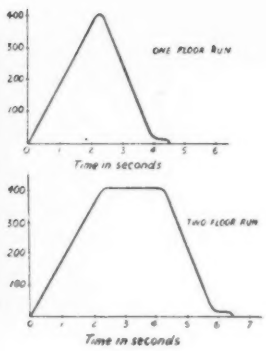

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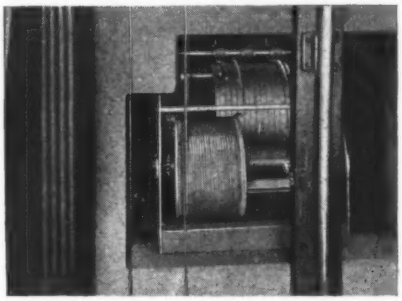

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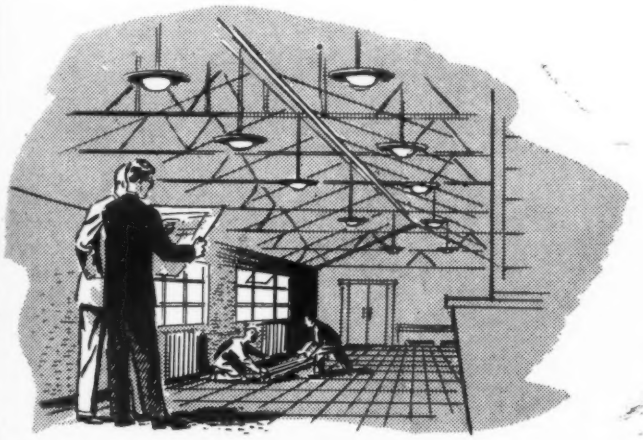

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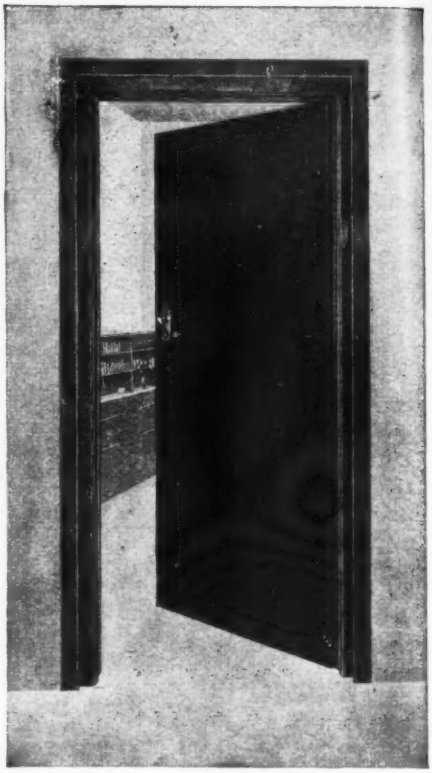

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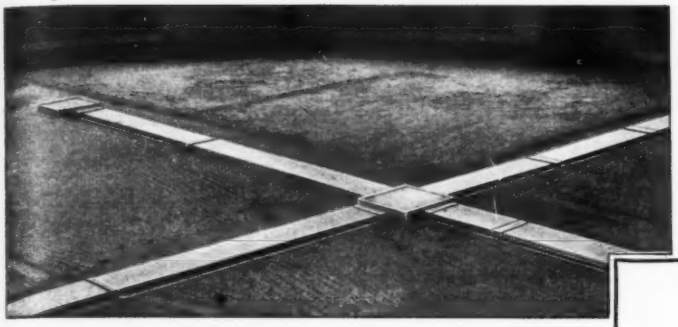

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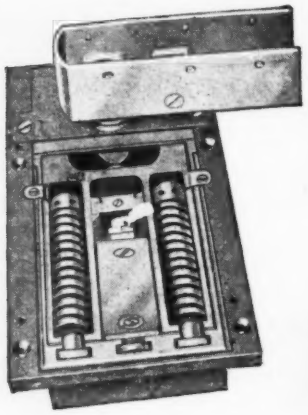

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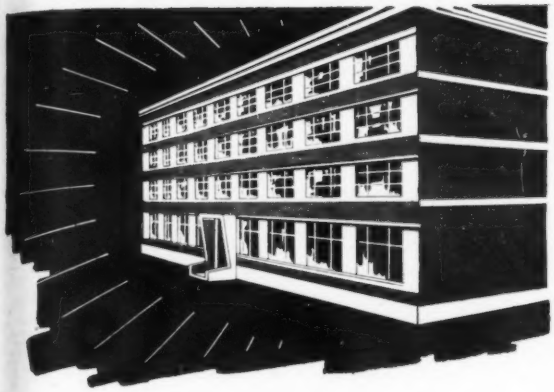

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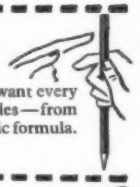

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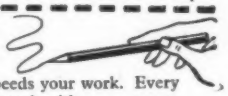

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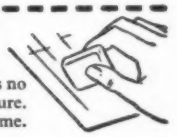

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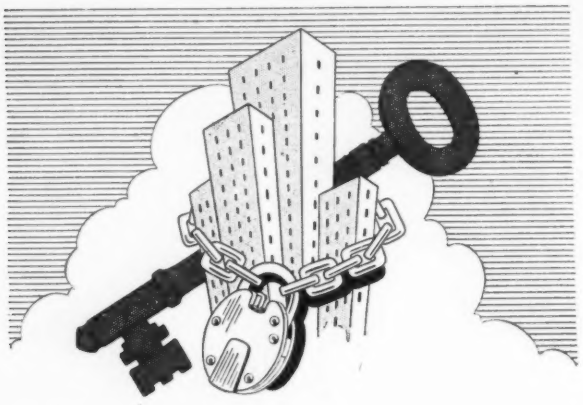

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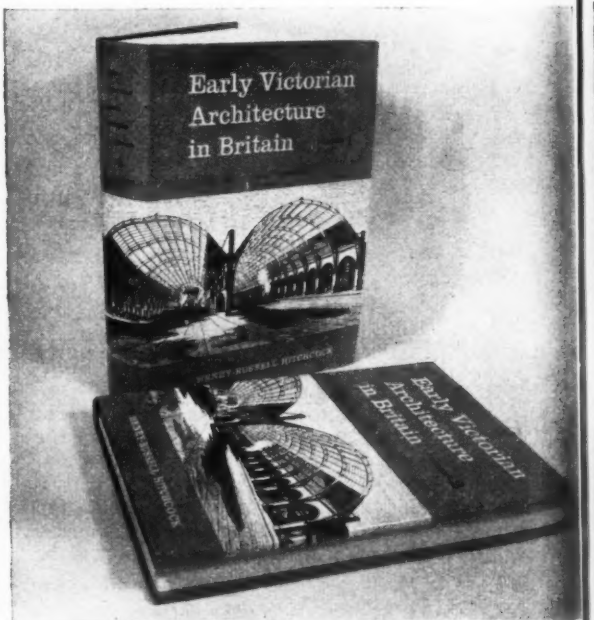
He shows that what is currently called 'Early Victorian' may in fact be Late Georgian, both in date and characteristically in style. Among the building types described are early railway stations and other iron structures, Anglican and nonconformist churches, public architecture, banks, commercial buildings, country houses and housing in general. A separate volume of illustrations, with plans, contemporary graphic material and many specially taken photographs, shows the full range of early Victorian architecture as it was conceived and as it is today.

Professor Hitchcock has contributed many articles to THE ARCHITECTURAL REVIEW, including 'In Search of a New Monumentality', 'Victorian Monuments of Commerce', 'Ear Cast Iron Façades'; and has written several books on architecture, among them being *Modern Architecture* (1929), *The International Style* and *In the Nature of Materials: The Architecture of Frank Lloyd Wright*. He is professor of Art at Smith College, Northampton, U.S.A. Size 10¾ ins. by 8 ins. Volume I, text, 658 pages; Volume II, plates, 232 pages. Price 7 guineas net, the set. Postage 2s. 0d.



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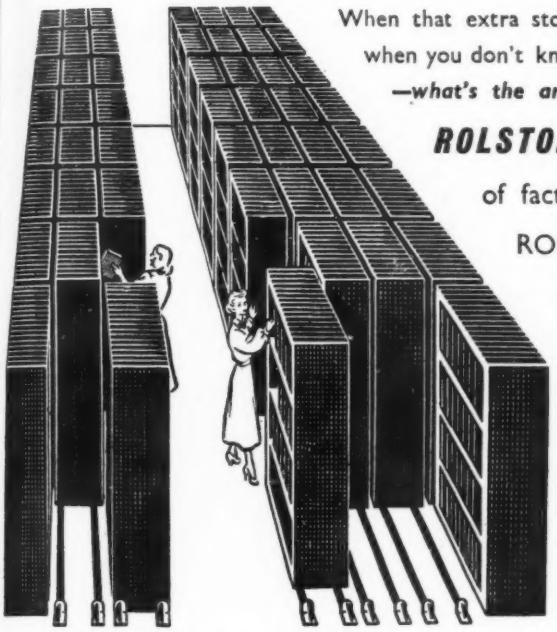

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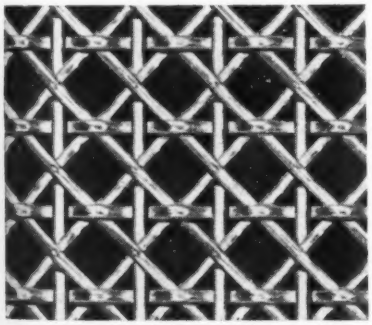

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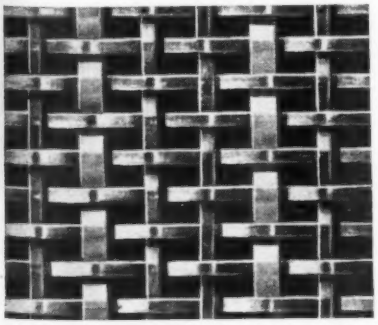

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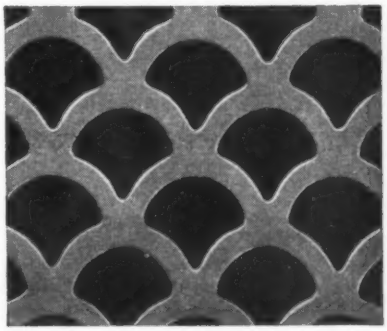

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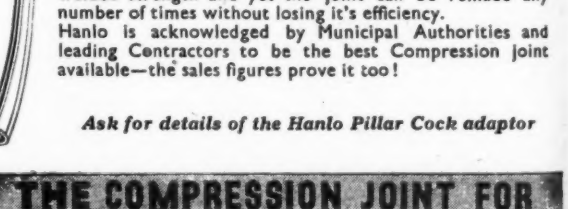

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CLASSIFIED ADVERTISEMENTS

Advertisements should be addressed to the Advt. Manager, "The Architects' Journal," 9, 11 and 13 Queen Anne's Gate, Westminster, S.W.1, and should reach there by first post on Friday morning for inclusion in the following Thursday's paper.

Replies to Box Numbers should be addressed care of "The Architects' Journal," at the address given above.

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25s. per inch; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

LONDON COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Vacancies for **ARCHITECTS**, Grade III (up to £945), and **ARCHITECTURAL ASSISTANTS** (up to £783), for widespread construction programme, which includes houses, blocks of flats, schools of all types, and various public and industrial buildings. Application forms and particulars from Architect (AR/EK/A/2), The County Hall, S.E.1. (1189) 2766

COUNTY BOROUGH OF DERBY.
BOROUGH ARCHITECT'S DEPARTMENT.

Applications are invited for the undermentioned appointments:—

ARCHITECTURAL STAFF:
A.P.T., Grade V (£750—£900 per annum).
A.P.T., Grade IV (£675—£825 per annum).
A.P.T., Grade III (£600—£725 per annum).
A.P.T., Grade II (£560—£640 per annum).
A.P.T., Grade I (£500—£580 per annum).
General Division, £275 at 20, rising to £475.

QUANTITY SURVEYING STAFF:
A.P.T., Grade V (£750—£900 per annum).
A.P.T., Grade III (£600—£725 per annum).
A.P.T., Grade II (£560—£640 per annum).
General Division, £275 at 20, rising to £475.

Starting grade will be appropriate to professional experience and qualifications.

Permanent superannuable appointments, subject to one month's notice and to medical examination. National Conditions of Service.

Applicants must state for which post they are applying.

Further particulars and application forms obtainable from and to be returned to The Borough Architect, The Council House, Corporation Street, Derby, not later than Monday, 24th October, 1955.

G. H. EMLYN JONES,
Town Clerk.

28th September, 1955. 3061

NORTHAMPTON RURAL DISTRICT COUNCIL.
SURVEYOR'S AND ARCHITECT'S DEPARTMENT.
APPOINTMENT OF QUANTITY SURVEYOR ASSISTANT.

Applications are invited for the above appointment (salary £560×£20 to £640 per annum).

Applicants should have passed the Final Examination of the R.I.C.S. (Quantity Section) or similar, and have had considerable experience in the preparation of Bills, measurement of site works, and preparation of interim statements and final accounts in connection with Housing Schemes.

The appointment will be terminable by one month's notice, in writing, on either side.

Applications, stating age, whether married or single, qualifications, full particulars of experience, together with copies of two recent testimonials, are to reach the undersigned by Saturday, 15th October, 1955.

Applicants must disclose whether they are related to any member or senior officer of the Council. Canvassing, either directly or indirectly, will disqualify.

CLIFFORD E. JONES,
Clerk of the Council.

Council Offices, 1, Cheyne Walk, Northampton.
27th September, 1955. 3071

BOROUGH OF NEWCASTLE-UNDER-LYME.
APPOINTMENT OF SENIOR ARCHITECTURAL ASSISTANT. GRADE A.P.T. IV (£675—£825 p.a.).

Applications are invited for the above appointment in the Department of the Borough Engineer.

Applicants must be fully qualified and experienced in the design and erection of New Schools. The commencing salary will be at a point within the Grade appropriate to experience and qualifications.

Favourable consideration will be given by the Council to the provision of housing accommodation if required.

Application Forms and Conditions of Appointment may be obtained from the Borough Engineer and Surveyor, Lancaster Building, High Street, Newcastle, Staffs., and must be returned to him by Monday, 24th October, 1955.

C. J. MORTON,
Town Clerk.

District Bank House,
High Street,
Newcastle, Staffs. 3185

CITY OF PETERBOROUGH.
ARCHITECTURAL ASSISTANT, GRADE II A.P. & T.

Applications are invited for the above appointment in the City Engineer's Department. Applicants should be of Intermediate R.I.B.A. standard, possess a sound knowledge of building construction, and be capable of preparing working and detail drawings under supervision.

Applications, stating age, experience, details of qualifications, together with copies of three recent testimonials, should be sent in envelopes endorsed "Architectural Assistant," to Mr. L. H. Robjohn, M.B.E., A.M.I.C.E., City Engineer and Surveyor, Town Hall Peterborough, to reach him not later than 22nd October, 1955.

Housing will be provided, if necessary.

Canvassing, directly or indirectly, will disqualify.

Candidates must disclose whether they are related to any member or senior officer of the Council.

C. PETER CLARKE,
Town Clerk.

Town Hall, Peterborough.
September, 1955. 3070

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

Applications are invited for the appointment of the following permanent staff of the Board's Architect, generally in accordance with Whitley Council conditions of service:—

ASSISTANT ARCHITECTS:

The commencing salary (fixed by reference to experience at full professional standards as a practising Architect and to age) will be within the scale £640×£25 (4)×£30 (4)×£35 (2) to £930, plus London allowance. Applicants must be Associate Members of the Royal Institute of British Architects, and capable of preparing working and detailed drawings and specifications, and supervising work on individual projects. Experience of Hospital planning and construction an advantage.

ASSISTANT QUANTITY SURVEYOR:

Commencing salary (fixed by reference to experience at full professional standard as a practising Quantity Surveyor and to age) will be within the scale £640×£25 (4)×£30 (4)×£35 (2) to £930, plus London allowance. Applicants must be Associate Members of the Royal Institution of Chartered Surveyors (Quantity Surveying branch), and have sound practical experience in the estimating and analysis of prices, working up and taking off quantities for small contracts, and also of checking Contractor's accounts.

ARCHITECTURAL ASSISTANTS:

The commencing salary (fixed by reference to practical experiences since passing one of the Examinations below, and to age) will be within the scale £480 (age 21 or over)×£20 (7)×£25 (2) to £670, plus London allowance. Applicants must have passed the Intermediate Examination of the Royal Institute of British Architects or an Examination recognised by the institute as equivalent, have had a good Architectural training and a general experience, and be capable of preparing working and detailed drawings.

Applications, stating age experience, qualifications, present appointment and salary, together with names and addresses of three referees, should be sent to the Secretary (S.2), 11a, Portland Place, London, W.1, by not later than 20th October. 3044

COUNTY BOROUGH OF CARLISLE.

Applications are invited for the following posts in the City Surveyor's Department:—

(*a*) **ASSISTANT ARCHITECT**, A.P.T., IV (£675×£30—£825).

Starting salary according to present salary and experience. Applicants should be A.R.I.B.A., and will be engaged on work included in Authority's Educational Building Programme.

(*b*) **CHIEF QUANTITY SURVEYOR**, A.P.T., Grade V (£750—£900).

Applicants should be Chartered Quantity Surveyors, and should be able to take charge of a section responsible for preparation of Estimates, Bills of Quantities, and Final Accounts for Schools, Housing and Municipal Buildings.

(*c*) **ENGINEERING ASSISTANT**, A.P.T., Grade IV (£675—£825).

Housing accommodation will be made available if required.

Forms from the City Surveyor, 18, Fisher Street Carlisle, returnable not later than 22nd October, 1955.

H. D. A. ROBERTSON,
Town Clerk.

3043

CORPORATION OF LONDON.
CITY PLANNING OFFICE
require

PRINCIPAL PLANNING ASSISTANT in charge of Planning and Civic Design Section at salary between £1,207 10s. and £1,365. Applications are invited from A.R.I.B.A., and A.M.T.P.I. with architectural experience in central area redevelopment, including three-dimensional massing of buildings.

ASSISTANT DEVELOPMENT OFFICER at salary between £857 2s. and £1,050 for examination of planning applications, particularly with regard to architectural aspects, and general assistance of development office. A.R.I.B.A. preferred. A.M.T.P.I. an advantage.

Applications to **CITY PLANNING OFFICER**, 55—61, Moorgate, London, E.C.2, within 14 days. 3174

BURGH OF HAMILTON.
CHIEF ASSISTANT ARCHITECT

Applications are invited for the above post from Associates of the Royal Institute of British Architects or equivalent qualification with wide experience in post-war housing and civic building design, etc. The post is superannuable and the salary A.P.T. V—VI (£665 to £815) with placing according to qualifications and experience. The successful applicant will be given the tenancy of a house if required.

Applications, containing full particulars of age, qualifications and experience, together with the names of three referees, should be lodged with the undersigned not later than Thursday, 20th October, 1955.

Canvassing, either directly or indirectly, will be a disqualification.

JAMES KELLY,
Town Clerk.

The Town House,
Hamilton.
5th October, 1955. 3175

COUNTY BOROUGH OF EAST HAM.

Applications are invited for the following appointments in the Housing Department:—

(*a*) **SENIOR ARCHITECTURAL ASSISTANT.** Salary: A.P.T. IV (£675 × £30—£825), plus London Weighting.

(*b*) **ARCHITECTURAL ASSISTANT.** Salary: Special Grade (£650 × £25—£775), plus London Weighting.

(*c*) **ARCHITECTURAL ASSISTANT** Salary: A.P.T. II (£560 × £20—£640), plus London Weighting.

The Department has an extensive and interesting programme of mixed development of houses, flats and shops, and the redevelopment of slums, including multi-storey flats.

Further details and forms of application (returnable by 26th October, 1955) from the Town Clerk, Town Hall, East Ham, E.6. 3142

COUNTY BOROUGH OF TYNEMOUTH.
BOROUGH SURVEYOR'S DEPARTMENT.

Applications are invited for the following posts:—

SENIOR ARCHITECTURAL ASSISTANT—Grade IV/V—£675—£900.

SENIOR TOWN PLANNING ASSISTANT—Grade V—£750—£900.

Application forms together with conditions of appointment should be obtained from D. M. O'Herlihy, Esq., B.Sc.(Eng.), M.I.C.E., 16, Northumberland Square, North Shields and returned before 29th October, 1955.

The Corporation may be prepared to assist in the provision of housing accommodation in the case of the two senior appointments.

FRED. G. EGNER,
Town Clerk.

3124

MIDLANDS ELECTRICITY BOARD.

ASSISTANTS required in the Architectural and Constructional Section of the Engineer's Department of the Birmingham and District Sub-Area.

Applicants should be capable of assisting in the preparation of working drawings and in the design of Offices, Depots, Service Centres, and Sub-stations.

Salary within the range of £510/£630 or £640/£740 per annum (N.J.B. Schedule "D" Grades 6 or 5) according to qualifications and experience. Superannuable.

Apply in writing, within fourteen days, stating age, experience, present position and salary to Emil Braathen, Sub-Area Manager, Midlands Electricity Board, 14, Dale End, Birmingham, 4.

A. STEPHENS,
Secretary.

30th September, 1955. 3147

LONDON ELECTRICITY BOARD.
STRUCTURAL ASSISTANTS AND STRUCTURAL DRAUGHTSMEN.

Applications are invited for the above positions in the Construction Branch of the Chief Engineer's Department in Central London.

Applicants for the positions of Structural Assistants in the Civil Engineer's Section should be experienced in the design and detailing of reinforced concrete and/or steel-framed superstructures and foundations.

Applicants for the positions of Structural Draughtsmen should have a knowledge of building construction requirements and/or some experience in detailing reinforced concrete or steel structures.

The posts are graded under Schedule "D", National Joint Board agreement, as Grade V (£672 to £777), and Grade VI (£535 10s. to £661 10s.) per annum, respectively inclusive of London allowance. Commencing salaries will be dependent on qualifications and experience.

Application forms obtainable from Personnel Officer, 46/7, New Broad Street, London, E.C.2, to be returned completed by 25th October, 1955. Please enclose addressed envelope and quote **Ref. V/2003/A.** 3087

DURHAM COUNTY COUNCIL—STAFF VACANCIES.

PLANNING ASSISTANT (Development Control). Salary £560—£640 p.a.

RESEARCH ASSISTANT. Salary £500—£580 p.a.

PLANNING ASSISTANT. Salary £500—£580 p.a.

Forms and particulars from County Planning Officer, 10, Church Street, Durham.

Closing date: 29th October, 1955.

J. K. HOPE,
Clerk of the County Council.

3072

LANCASHIRE COUNTY COUNCIL.

THERE ARE VACANCIES FOR ASSISTANT ARCHITECTS IN THE OFFICE OF THE COUNTY ARCHITECT (G. NOEL HILL, F.R.I.B.A., M.T.P.I.), WHERE THE WORK IS DEALT WITH FROM THE PURCHASE OF THE SITE TO THE FURNISHING OF THE BUILDING AND THE ARCHITECT HAS EXPERIENCE OF REGULAR CONTACTS WITH MEMBERS OF OTHER PROFESSIONS ON THE STAFF—LAND SURVEYORS, ENGINEERS AND QUANTITY SURVEYORS.

THE FOLLOWING VARIETY OF POSTS ARE OFFERED:—

POST "A" (£750—£900). For Architects who prefer to work in a group on large school contracts.

POST "B" (£675—£825). For the Architect who prefers to work largely on his own, on a programme of minor projects, *i.e.*, additional class-rooms, school kitchens, etc.

POST "C" (£675—£825). For Architects who want a general experience on a variety of County buildings; to work in a group and have charge of small projects.

APPOINTMENTS ABOVE THE MINIMUM OF THE GRADE MAY BE RECOMMENDED.

Application forms, obtainable from the County Architect, P.O. Box 26, County Hall, Preston, to be returned by Monday, 24th October, 1955, quoting Ref. A/AJ. 3030

CITY OF OXFORD.
CITY ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.

Three ARCHITECTURAL ASSISTANTS (two permanent; one temporary) required within the salary range £650—£775 per annum. Candidates must have passed the Final Examination of the Royal Institute of British Architects, and capable of preparing sketch designs, full working drawings, specifications, etc., and competent to undertake housing, educational and general architectural work. National Conditions of Service: medical examination.

HOUSING ACCOMMODATION, if required, will be provided by the Council.

Application forms and conditions of appointment from The City Architect and Planning Officer, Town Hall, Oxford, to be returned by 29th October, 1955.

HARRY PLOWMAN,
Town Clerk.
3148

BOROUGH OF ERITH.
THIRD ARCHITECTURAL ASSISTANT.

Applications are invited from young, contemporary-minded ASSISTANTS for the above vacancy in the Borough Architect's Department, at a salary in accordance with Grade A.P.T., II (£560×£20—£640 per annum, plus London weighting).

Applications, stating age, education and training, previous appointments and experience, together with names and addresses of two referees, should reach the Borough Engineer and Surveyor not later than the 24th October, 1955. Canvassing disqualifies.

J. A. CROMPTON,
Town Clerk.
Town Hall, Erith, Kent. 3091

BOROUGH OF WIMBLEDON
BOROUGH ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the following appointments on the established staff:—

(*a*) ARCHITECTURAL ASSISTANT, Grade—Special.

(*b*) ARCHITECTURAL ASSISTANT. Grade—A.P.T. I.

Salary for post (*a*) £650 to £775 per annum, and for post (*b*) £500 to £580 per annum, London Weighting additional. Applicants for post (*a*) must be registered Architects and should be members of the R.I.B.A. and for post (*b*) should have attended a full time course of Architecture, and have passed the R.I.B.A. Intermediate Examination or its equivalent. Experience in municipal architectural work would be an advantage.

The appointments are subject to the National Scheme of Conditions of Service, the provisions of the Local Government Superannuation Acts and to satisfactory medical reports.

Applications endorsed "Architectural Assistant—Special Grade" or "Architectural Assistant—A.P.T.I." stating age, qualifications, all former Local Government Service present and previous appointments and experience, length of notice required to terminate present appointment and the names of three referees, must be forwarded to the Borough Engineer and Surveyor by 29th October, 1955.

Candidates must disclose to the undersigned if, to their knowledge, they are related to any member or senior officer of the Council. Canvassing disqualifies.

FRANCIS J. O'DOWD,
Town Clerk.
Town Hall,
Wimbledon, S.W.19. 3199

COMMONWEALTH OF AUSTRALIA.
DEPARTMENT OF WORKS.

ARCHITECTS, ENGINEERS and QUANTITY SURVEYORS are required on Design and Construction Work associated with National Defence Projects, Government Buildings including Post Offices, telephone exchanges, Airport Buildings, Hospitals, Schools, housing, etc., Aerodrome runways and taxiways, wharfs, bridges, roads, sewerage, water supply, drainage, etc., and associated electrical and mechanical engineering, including Air-conditioning.

ARCHITECTS should hold academic qualifications "Fellow or Associateship elect of the Royal Institute of British Architects" or "The Diploma of a School of Architecture recognised for exemption from the R.I.B.A. final examination granted at a date when the school was so recognised."

ENGINEERS (Civil, Electrical and Mechanical) should be qualified and a Member or eligible for Membership of an Institute of Engineers, which would automatically entitle applicants to Membership of the Institution of Engineers (Australia).

QUANTITY SURVEYORS should be qualified to, or be a Member of the Royal Institution of Chartered Surveyors or the Institute of Quantity Surveyors.

UNDERGRADUATES OR OTHERS within their final year of study of Architecture, Engineering, or Quantity Surveying will be considered for appointment subject to satisfactorily completing their studies and becoming eligible for membership of an Institute (as above).

VACANCIES are existing in Sydney, Melbourne, Adelaide, Perth, Brisbane, Canberra, Darwin, and Port Moresby (Papua-New Guinea).

Salary Ranges (Australian); minimum commencing salaries are, on qualifying:—

Diplomate, £974; graduate—three-year University, £1,016; graduate—four-year University or Honours Graduate, three-year course, £1,058; graduate with Honours four- or five-year course, £1,100.

Other positions ranging up to £1,562, depending upon the experience of the applicant.

Good prospects of promotion to higher offices are available, dependent upon ability.

Salary will be paid from actual date of embarkation.

Fares will be paid from England to Australia.

Accommodation will be discussed with applicants.

Recreation and sick leave, superannuation, etc. Particulars are available from the undermentioned address:—

Applications, returnable 29/10/55, to be addressed to:—

The Public Service Board Representative,
Australia House,
Strand, London, W.C.2. 3172

BOROUGH OF LEYTON
(In the County of Essex)
LEYTON COMMITTEE FOR EDUCATION.
APPOINTMENT OF ARCHITECTURAL ASSISTANTS

Applications are invited for the following permanent appointments at salaries in accordance with the National Scales indicated:—

(*a*) ARCHITECTURAL ASSISTANT, A.P.T. Grade III (£630—£755 per annum).

(*b*) JUNIOR ARCHITECTURAL ASSISTANT, A.P.T. Grade I (£530—£610 per annum)

The above salaries are inclusive of London Weighting (£30) which is reduced according to scale where age is less than 26. The successful applicants will be employed by the Essex County Council, and will work in the School Architect's Section of the Borough Engineer and Surveyor's Department, Town Hall, Leyton, London, E.10.

Alternate Saturday mornings free of duty and canteen facilities available.

Details and forms of application from the Borough Education Officer, Kirkdale Road, Leytonstone, London, E.11, to whom they should be returned by Friday, 4th November, 1955.

D. J. OSBORNE,
Town Clerk.
Town Hall,
Leyton, E.10. 3170

WARWICKSHIRE COUNTY COUNCIL.
ARCHITECT'S DEPARTMENT.

Applications are invited for the following appointments:—

(*a*) SENIOR ASSISTANT ARCHITECTS GRADE APT. V. Salary scale £750 to £900.

(*b*) ASSISTANT ARCHITECTS GRADE APT IV. Salary scale £675 to £825.

(*c*) ARCHITECTURAL ASSISTANTS GRADE APT II. Salary scale £560 to £640.

(*d*) QUANTITY SURVEYING ASSISTANT GRADE APT II-III. Salary scale £560 to £725.

(*e*) JUNIOR QUANTITY SURVEYING ASSISTANT GRADE APT I-II. Salary scale £500 to £640.

Applicants for (*a*) and (*b*) must be registered Architects. The commencing salary can be within the grades, according to ability and experience. All appointments are subject to the conditions of the Local Government Superannuation Acts 1937-53.

Applications are to be made on forms which should be obtained from G. R. BARNSLEY, F.R.I.B.A., County Architect, Shire Hall, Warwick.

L. EDGAR STEPHENS,
Clerk of the Council.
Shire Hall,
Warwick.
6th October, 1955. 3212

GOLD COAST GOVERNMENT.
VACANCIES FOR ARCHITECTS—PUBLIC WORKS DEPARTMENT.

Applications are invited for vacancies in the post of Architects in the Public Works Department.

Duties: The Architects will be required to carry out investigation for, plan, design and supervise the construction of new Government buildings arising in connection with the Government's development programme such as quarters, offices, hospitals, schools, halls, reading rooms, etc. They will also be responsible for the preparation of working drawings and specifications, and the administration of contracts.

Qualifications: Candidates must be Associates of the Royal Institute of British Architects. Previous experience of Government or Local Authority Work is desirable and of Hospital or Bank Buildings an advantage.

Terms of Service: Some of these posts are "Development Posts" for implementation of specific projects under the Gold Coast Development Plan. The appointments will be on contract/gratuity terms for one tour of 18 to 24 months, with a possible extension to two tours. Salary will be in the range £1,130—£2,020 per annum (consolidated) according to age, qualifications and experience. A gratuity at the rate of £37 10s. for each completed three months of satisfactory service will be payable on final termination of the contract.

Free passages on first appointment and on leave will be provided for the officer and his wife once each way during each tour of service. Officers will normally be required to travel by air. Free air passages will also be provided for a maximum of three children under 13 years of age.

Vacation leave with pay; seven days for each month of service. Free medical and dental attention provided for officer and family. Reasonable but substandard (at present) partly furnished quarters are available at low rentals. Income-tax at local rates. Kit allowance on first appointment £60—£30, according to salary (if no recent tropical experience).

For candidates in Local Government Service, arrangements are possible for superannuation rights to be frozen.

Intending candidates should apply to the Adviser on Recruitment, Gold Coast Office, 13, Belgrave Square, London, S.W.1, for a form of application. 3169

STAFFORDSHIRE COUNTY COUNCIL
EDUCATION ARCHITECT'S DEPARTMENT.

Applications are invited from candidates for the following appointments.

The Department has a large programme of interesting work for all kinds of educational establishments, including Libraries, and is situate in a pleasant part of the town.

Lodging allowances for married men maintaining a home outside the geographical County can be arranged up to six months.

Staff dining room available.

ARCHITECTS.—Maximum, according to qualifications and experience, Grade A.P.T. IV (£675—£825 p.a.).

ELECTRICAL ENGINEER (capable of preparing large schemes).—Maximum, according to qualifications and experience, Grade A.P.T. IV (£675—£825 p.a.).

HEATING ENGINEERS (capable of preparing large schemes).—Maximum, according to qualifications and experience, Grade A.P.T. IV (£675—£825 p.a.).

QUANTITY SURVEYOR (R.I.C.S. or equivalent).—Contract settlement and estimating. Grade A.P.T. VI (£825—£1,000 p.a.).

Forms of Application from The County Education Architect, Green Hall, Lichfield Road, Stafford, to be returned within ten days from the date of this advertisement.

T. H. EVANS,
Clerk of the County Council.
3186

COUNTY BOROUGH OF NORTHAMPTON require for Borough Architect's Department:—

(*a*) SENIOR ASSISTANT ARCHITECT. Grade A.P.T. V (£750—£900). Opportunity for Associate R.I.B.A. to run the Housing Section, with a varied programme, including multi-storey flats, slum clearance and two-storey housing.

(*b*) ASSISTANT ARCHITECT. Scale £650—£775: to work in the Education and General Section on interesting major projects, including a Technical High School. Candidates must have passed final examination of R.I.B.A.

Full details and application forms returnable by 24th October from Borough Architect, Guildhall, Northampton.

C. E. VIVIAN ROWE,
Town Clerk.
3203

METROPOLITAN BOROUGH OF WANDSWORTH.
SENIOR ASSISTANT ARCHITECT.

Applications invited for this established appointment in grade A.P.T. VII (£930—£1,130).

Applicants must be associates of the R.I.B.A. and have had experience in the design and planning of housing estates, particularly multi-storey blocks of flats and/or other framed buildings, and in the supervision of their erection. Experience in local authority work is desirable. Applicants must also be experienced in the control of drawing office staff and should possess the qualities of leadership.

Application forms obtainable from the Borough Engineer, Surveyor and Architect must reach me by 17th October, 1955.

R. H. JERMAN,
Town Clerk.
3146

BOROUGH OF WALTHAMSTOW.
BOROUGH ARCHITECT, ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the following appointments in the Department (F. G. Southgate, A.R.I.B.A., M.I.Mun.E., A.M.T.P.I., Borough Architect, Engineer and Surveyor).

(*a*) SENIOR ASSISTANT ARCHITECT.

(*b*) ASSISTANT QUANTITY SURVEYOR.

The salary for post (*a*) will be in accordance with A.P.T. Grade V (£780—£930, inclusive of London Weighting) with the commencing salary according to experience.

Applicants must be Registered Architects.

The salary for post (*b*) will be in accordance with A.P.T. Grade II (£590—£670, inclusive of London Weighting) with the commencing salary according to experience.

Applicants must have had at least two years' recent practical experience.

Applications with the names of two persons for reference should be received by the undersigned not later than noon on Saturday, 29th October, 1955, endorsed "Senior Assistant Architect" or "Assistant Quantity Surveyor."

G. A. BLAKELEY,
Town Clerk.

3202

CHESTER RURAL DISTRICT COUNCIL.
ARCHITECTURAL ASSISTANT.

Applications are invited for the above appointment in the Architect's Department at a salary within Grade II of the A.P.T. Division of the National Scale of Salaries.

General Architectural experience is necessary and applicants must be capable of preparing plans and layouts for housing schemes. Preference will be given to candidates who have passed the Intermediate Examination of the Royal Institute of British Architects.

Housing accommodation may be made available if required.

The appointment will be subject to the National Joint Council Scheme of Conditions of Service and to one month's notice in writing on either side.

Applications, stating age, qualifications, particulars of experience, and whether or not applicant is related to any member or senior officer of the Council, together with the names of two referees, must be received by the undersigned by Tuesday, 25th October, 1955.

G. A. MORGAN,
Clerk to the Council.

Council Offices,
16, White Friars,
Chester. 3210

EAST RIDING OF YORKSHIRE COUNTY COUNCIL.

Applications are invited for the following permanent appointments on the staff of the County Architect:—

(*a*) ASSISTANT ARCHITECT, Special Scale (£650—£775).

(*b*) ARCHITECTURAL ASSISTANT, Grade II (£560—£640).

(*c*) STRUCTURAL ENGINEER, Grade IV (£675—£825).

(*d*) ASSISTANT HEATING AND ELECTRICAL ENGINEER, Grade III (£600—£725).

(*e*) ASSISTANT HEATING ENGINEER, Grade I (£500—£580).

The appointments are superannuable and subject to the passing of a medical examination.

Applications, giving particulars of age, training, qualifications, experience, past and present appointments stating salaries, together with the names of three referees, should be addressed to the County Architect, County Hall, Beverley, and must be received by him not later than Tuesday, 18th October, 1955.

THOMAS STEPHENSON,
Clerk of the Council.

County Hall,
Beverley. 3211

COUNTY BOROUGH OF BURY.

Applications invited from suitably qualified persons for the appointment of ARCHITECTURAL ASSISTANT, Borough Engineer's Department, Special Grade (£650—£775).

Applications, stating age, details of training, qualifications and experience, together with names and addresses of two persons to whom reference may be made, must reach me not later than 28th October.

EDWARD S. SMITH,
Town Clerk.

Town Hall,
Bury.
4th October, 1955. 3171

MID-ESSEX TECHNICAL COLLEGE AND SCHOOL OF ART.

Market Road, Chelmsford, Essex.

Applications are invited (preferably from chartered architects with teaching experience) for a Part-time post in GENERAL and SPECIALISED HISTORY OF ARCHITECTURE for one half-day per week (3 hours), and BUILDING SCIENCE, MATERIALS and STRUCTURES for one day per week (6 hours).

Application forms from Clerk to the Governors. 3132

SURREY COUNTY COUNCIL.

Applications invited for appointment of ASSISTANT QUANTITY SURVEYOR Grade IV, £675 × £30—£825 p.a., plus London allowance. Should be Associate Member R.I.C.S.

Full details and present salary, with three copy testimonials to County Architect, County Hall, Kingston, as soon as possible. 3167

BIRMINGHAM REGIONAL HOSPITAL BOARD.
ARCHITECTURAL STAFF APPOINTMENTS.
(Donald A. Goldfinch, ERD., FRIBA., Dip.TP—Architect to the Board).

(*a*) SENIOR ASSISTANT ENGINEER (heating and ventilation) £920 × £30(5) × £25(1) — £1,095. Duties include design, preparation of plans, specifications and technical reports; supervision of new installations of heating and ventilation, boiler house plants and other hospital services. AMI.Mech.E. essential, AMIH. & VE. desirable.

(*b*) ASSISTANT ARCHITECTS (2)—£640 × £25(4) × £30(4) × £35(2) — £930 according to age and experience. Applicants must be registered architects having passed requisite examinations. Experience of hospital planning and construction an advantage. Sound knowledge specifications essential.

(*c*) ASSISTANT QUANTITY SURVEYORS (2)—£640 × £25(4) × £30(4) × £35(2) — £930. Final RICS or IQS or IAAS and experience in taking off and preparing bills of quantities and settling final accounts essential.

(*d*) ASSISTANT ENGINEERS (2)—£640 × £25(4) × £30(4) × £35(2) — £930 according to age and experience. AMIHVE desirable.

(*e*) ARCHITECTURAL ASSISTANTS (2) (required for large new hospital project)—£480 × £20(7) × £25(2) — £670. Point of entry according to experience—maximum £560. Inter-RIBA essential.

(*f*) JUNIORS (2 architectural, 1 engineering)—Male (aged 16) maximum £400 (aged 25), Female £165 (aged 16) maximum £330 (aged 25) (salary under revision equal pay to be implemented). Successful candidates expected to study for professional examinations.

All appointments superannuable. Apply naming three referees to Secretary, 10, Augustus Road, Birmingham, 15, by 28th October, 1955. 3216

BOROUGH OF WATFORD.
APPOINTMENT OF ASSISTANT ARCHITECTS.

(*a*) GRADE A.P.T. IV.

(*b*) GRADE A.P.T. II.

Applications are invited for Assistant Architects within the above Grades, according to qualifications and experience. Applicants for (*a*) should be Registered Architects.

Forms on application, returnable by 31st October, 1955.

Consideration will be given to the provision of housing accommodation if required.

F. C. SAGE, A.M.I.C.E., M.I.Mun.E.
Borough Engineer, Surveyor & Architect.

Town Hall, Watford. 3213

SUNBURY-ON-THAMES URBAN DISTRICT COUNCIL.

A vacancy exists in the office of the Council's Architect and Surveyor for an ARCHITECTURAL ASSISTANT at a salary in accordance with Grade II of the A.P. & T. Division of the National Scales of Salaries (£560 to £640 per annum) plus London Allowance.

Applications, giving the names of two persons to whom reference may be made, should be sent to Mr. A. J. Buttress, L.R.I.B.A., Architect and Surveyor, Council Offices, Sunbury-on-Thames, Middlesex, not later than 31st October, 1955. 3220

BOROUGH OF GRANTHAM.
CHIEF ASSISTANT ARCHITECT.

Applications are invited for the above appointment in the Department of the Borough Engineer and Surveyor at a salary within Grade V (£750—£900).

Applicants must be Registered Architects with good general experience, and be capable of preparing and supervising all building schemes (principally housing) undertaken by the Corporation.

Housing accommodation will be available to the successful candidate, if required.

The appointment is subject to the National Scheme of Conditions of Service, the Local Government Superannuation Acts, the passing of a medical examination, and is terminable by one month's notice on either side.

Applications, stating age, qualifications, training and experience, previous and present positions, together with the names of two referees, should be received by the Borough Engineer and Surveyor, Guildhall, Grantham, not later than Tuesday, 1st November, 1955.

JOHN F. GUILE,
Town Clerk.

Guildhall,
Grantham,
5th October, 1955. 3215

GRAPHIC DESIGNER with experience of illustration and typography required by London County Council for Section dealing with exhibitions and display work. Commencing salary up to £783 according to experience and qualifications. Application forms, returnable by 10th November from Architect (AR/EK/FD/2), The County Hall, S.E.1. (1586) 3149

URBAN DISTRICT COUNCIL OF BASILDON.
Population estimated at 53,000.
Area 27,020 *acres.*
ENGINEER AND SURVEYOR'S DEPARTMENT.

Applications are invited for the appointment of SENIOR ARCHITECTURAL ASSISTANT, Special Scale £650—£775 p.a., commencing salary according to experience. Applicants should be Associates of the R.I.B.A.

Full particulars and application forms from and returnable to Mr. S. A. Wadsworth, A.M.I.C.E., A.M.I.Mun.E., Council Offices, High Street, Billericay, Essex. Closing date, 24th October, 1955. 3156

BOROUGH OF MANSFIELD.
APPOINTMENT OF THIRD ARCHITECTURAL ASSISTANT.

Applications are invited for the above appointment in the Borough Engineer and Surveyor's Department. The salary will be in accordance with the special grade for qualified assistants (£650—£775) of the National Joint Council's Scale and the following conditions:—

1. N.J.C. Conditions of Service.
2. Local Government Superannuation Acts, for which purpose the selected candidate will be required to pass a medical examination.
3. Residence within the Borough.

Applicants should have passed the Final Examination of the R.I.B.A. or equivalent examination.

A house on service tenancy agreement is available.

Applications stating age, qualifications, present appointment and salary, previous appointments and experience, together with the names and addresses of not more than three referees should be sent to the Borough Engineer and Surveyor, Carr Bank, Mansfield and should be endorsed "Third Architectural Assistant." The closing date is 24th October, 1955.

A. C. SHEPHERD,
Town Clerk.

Carr Bank,
Mansfield. 3155

CITY OF OXFORD.
CITY ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.
Vacancy for PLANNING ASSISTANT.

Salary within range General Division—£650—£775 per annum, according to qualifications and experience. The work on which the successful candidate will be engaged will include the preparation of plans for areas of comprehensive development. He must be able to achieve a high standard of draughtsmanship and be a good colourist. Preference given to candidates able to undertake perspective drawings and free-hand sketches of a wide range of subjects. Experience in construction of models an advantage. To qualify for the higher salary range applicants must be members of the Town Planning Institute.

Appointment, in first instance, to the Temporary Staff, but otherwise subject to National Conditions of Service and the Local Government Superannuation Act 1937; medical examination.

Forms of application and conditions of appointment from the City Architect and Planning Officer, Town Hall, Oxford; closing date 29th October, 1955.

HARRY PLOWMAN,
Town Clerk.

3203

COUNTY BOROUGH OF HUDDERSFIELD.
BOROUGH ARCHITECT AND PLANNING OFFICER'S DEPARTMENT.

Applications are invited for the post of ARCHITECTURAL ASSISTANT, Grade A.P. & T. II (£560—£640). Preference given to applicants who have passed the R.I.B.A. Intermediate Examination. The post is subject to the National Scheme of Conditions of Service, as adopted by the Council, and to medical examination.

Housing accommodation will be provided, if required.

Applications with the names of two referees should reach S. M. Richmond, F.R.I.B.A., A.M.T.P.I., Borough Architect and Planning Officer, High Street Buildings, Huddersfield, not later than the 31st October, 1955.

Canvassing directly or indirectly will disqualify.

HARRY BANN,
Town Clerk.

Town Hall,
Huddersfield.
October, 1955. 3176

HEMEL HEMPSTEAD DEVELOPMENT CORPORATION.

Applications invited for appointment of SENIOR PLANNER and PLANNING ASSISTANT. Salaries in scales ranging from £520—£1,275, according to qualifications, age and experience.

Applicants should hold a Town Planning or Architectural Qualification.

Appointment subject to Development Corporation's staff rules and conditions of service (which are broadly similar to the Local Government Officers' "Charter").

Contributory superannuation, with an opportunity of entering in Local Government Superannuation Fund.

Housing accommodation may be provided.

Applications, giving particulars of age, qualifications and experience, the names of two persons to whom reference may be made, and endorsed "Vacancy No. 43" should reach undersigned by 26th October, 1955.

W. O. HART,
General Manager.

Westbrook Hay,
Hemel Hempstead, Herts. 3178

AIR MINISTRY Works Designs Branch require in London and Provinces (with liability for overseas service) ARCHITECTURAL ASSISTANTS experienced in planning/preparation of working drawings and details for permanent and semi-permanent buildings. Salaries up to £850 p.a. (men) and £735 (women). Starting pay based on age, qualifications, and experience. Paid overtime. Posts non-pensionable with long term possibilities. Natural born British subjects only. Write stating age, qualifications, employment details, including type of work done, to any Employment Exchange, quoting Order No. BOROUGH 2303. 2163

LINDSEY COUNTY COUNCIL.
PLANNING ASSISTANTS.

A.P.T., II (£560—£640). Must have passed Inter. T.P.I., and had experience at all stages in preparation of Town Maps.

A.P.T., I (£500—£580). Must have been trained in planning, architect's or surveyor's office, and be capable in field surveys and draughtsmanship. Superannuation and N.J.C. service conditions. Apply with particulars of age, training, qualifications and experience, and naming two referees, to R. L. Stirling, County Planning Officer, The Castle, Lincoln, before 21st October, 1955. Canvassing will disqualify, and relationship to any member or senior officer of the Council to be disclosed in application. 3064

THURROCK URBAN DISTRICT COUNCIL (Engineer and Surveyor's Department) require a JUNIOR PLANNING ASSISTANT. Salary: A.P.T. I (£500—£580 per annum). The appointment is pensionable and offers exceptional opportunities for experience in development control of a rapidly growing Urban District with delegated powers, present population 97,000. Applicants to be neat draughtsmen, capable of surveying and levelling.

Apply stating age and experience with names of two referees to Clerk of the Council, Council Offices, Grays, Essex, by 18th October. Canvassing disqualifies. Relationship to any member or senior officer of the Council must be disclosed. 3121

THE LONDON HOSPITAL, Whitechapel, E.1, requires CHIEF ASSISTANT ARCHITECT. Salary £850—£950 per annum. Applications, stating age, experience, etc., to the House Governor. 2922

BUCKS COUNTY COUNCIL.

Applications are invited for the appointment of TWO ASSISTANT ARCHITECTS, Architects' Special Scale (£650—£775), in the County Architect's Department.

The appointments are superannuable and subject to medical examination.

A weekly allowance of 25s. and return fare home once every two months may be paid for six months to newly appointed married officers of the Council unable to find accommodation.

Applications, on forms to be obtained from F. B. Pooley, County Architect County Offices, Aylesbury, must be returned by 24th October, 1955. 3103

BOROUGH OF ROMFORD.

Applications are invited for the under-menticned posts in the Borough Engineer and Surveyor's Department:—

(i) JUNIOR CLERK, Salary £170—£475 per annum, according to age (salary at age 20, £275).

(ii) ARCHITECTURAL ASSISTANT, salary Grade A.P. & T. I, £500—£580 per annum.

(iii) JUNIOR ARCHITECTURAL DRAUGHTSMAN—Salary £170—£475 per annum, according to age.

Particulars and Conditions of each of these appointments obtainable from the Town Clerk, Town Hall, Romford, Essex, to whom completed applications must be forwarded by the 24th October. 3200

BRACKNELL DEVELOPMENT CORPORATION.

Applications are invited from Corporate Members of the R.I.B.A. for the post ASSISTANT ARCHITECT Grade IV—salary £710 × £40(6) × £10(1) — £960.

Superannuation schemes, medical examination. Housing available in due course. Apply by 28th October, 1955, giving age, education and qualifications, experience and appointments held (with dates and salaries) and names of two referees to the General Manager, (A.A.) Bracknell Development Corporation, Farley Hall, Bracknell, Berks. 3214

UNIVERSITY OF OXFORD.

Applications are invited for the following appointments:—

(*a*) ARCHITECTURAL ASSISTANTS of Intermediate to Final standard, capable of carrying out jobs from survey to final account under supervision. Salary £550—£675.

(*b*) ARCHITECTURAL ASSISTANTS of about Intermediate standard with some knowledge of modern building construction. Salary £450.

Varied and interesting work. Generous leave. Apply for further particulars, stating age, experience, and training, to the Surveyor to the University, 5, South Parks Road, Oxford. 3162

MIDDLESEX COUNTY COUNCIL—COUNTY PLANNING DEPT.

SENIOR PLANNING ASSISTANT (A.P.T. IV —£705—£855 p.a., if 26 years or over). Should have good experience and qualifications in planning or architecture. Established, pensionable, subject to medical assessment and prescribed conditions. Application forms from County Planning Officer, 10, Gt. George Street, S.W.1, returnable by 28th October (quote R.444 A.J.). Canvassing disqualifies. 3130

MINISTRY OF WORKS require ARCHITECTURAL ASSISTANTS for drawing offices in London, Edinburgh and various provincial offices, with at least three years' training, experience in an architect's office and of Inter. R.I.B.A. standard. London salary £463 to £725 p.a., elsewhere slightly less. Starting pay according to age and experience, prospects of promotion and permanency. State age, details of training and experience, to Chief Architect, Ministry of Works, A27 (F), Abell House, John Islip Street, London, S.W.1. 3168

Architectural Appointments Vacant

4 lines or under, 7s. 6d.; each additional line, 2s.

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she or the employment is excepted from the provisions of the Notification of Vacancies Order, 1952.

BRITISH HOME STORES, LTD., require ARCHITECT'S ASSISTANTS of various grades between 27 and 40 years of age for their Architect's Department. Salary rates from £650 to £1,000 per annum, according to experience. Applicants must have had at least 4 years' office experience. Positions give good opportunities for up-grading. Contributory pension scheme, non-contributory life assurance scheme, and subsidised staff canteen in operation. Applications in writing, giving full details of age, experience, etc., to be sent to Personnel Manager, British Home Stores, Ltd., Marylebone House, 129-137, Marylebone Road, London, N.W.1. 2961

ARCHITECTURAL ASSISTANTS, Intermediate and Final standard, required immediately in busy established Architect's office, North of London. Varied work of contemporary character, comprising industrial, commercial and housing projects. Please reply, giving details of experience, qualifications, when available, and salary required, to Box 2948.

MISHA BLACK requires ARCHITECTURAL ASSISTANTS to join Design Research Unit. Work would include the design of buildings, interiors, exhibitions. Salary £550 to £750. Apply in writing to Design Research Unit, 37, Park Street, W.1. 2952

ASSISTANT required in busy practice in West End, in early twenties, about Intermediate R.I.B.A. Standard. Excellent opportunities for gaining all round experience. Box 1942.

DEACON & LAING, 9, St. Paul's Square, Bedford, have a further vacancy for a keen ASSISTANT, under 30, for a variety of interesting work. 3023

THE LONDON HOSPITAL, Whitechapel, E.1, requires CHIEF ASSISTANT ARCHITECT. Salary £850—£950 per annum. Applications, stating age, experience, etc., to the House Governor. 2923

SENIOR ASSISTANT required, to take charge of medium size jobs. Must have good office experience. Salary in the region of £800 p.a. Five-day week. Morris de Metz, F.R.I.B.A., 2, Ludgate Hill, E.C.4. Tel. No. CITy 4086. 3021

SENIOR SHOPFITTING DRAUGHTSMAN required by leading London Shopfitters. Salary £800 to £1,000, plus bonus and pension scheme. Box 3018.

ASSISTANTS of Intermediate or equivalent standard required to assist with large schemes of contemporary nature. Salary according to experience and ability. Please write, giving full particulars of experience, to Johns, Slater & Haward, F./A.R.I.B.A., 32, Foundation Street, Ipswich. 2919

ARCHITECTURAL ASSISTANTS, of R.I.B.A. Final or Intermediate standard (or equivalent) required immediately for interesting and varied work in private practice, 50 miles London. Salary in accordance with age and experience. Please send full details to Box 3024.

RONALD WARD & PARTNERS require several capable ARCHITECTURAL ASSISTANTS, with contemporary outlook and willing to use own initiative. Salary range £400 to £800. Interesting and varied work, home and abroad. Congenial working conditions. Apply 29, Chesham Place, Belgrave Square, S.W.1. Telephone: Belgravia 3361. 2135

JUNIOR ASSISTANT, competent to make measured surveys and prepare working drawings, required by Wallis & Smith, Chartered Architects, Basingstoke. Apply by letter, stating salary required. 2533

ARCHITECTURAL ASSISTANTS, Senior and Junior required, preferably with London practice experience, office and factory buildings. Write, giving particulars of experience, etc., to Messrs. Bates & Sinning, 89, Chancery Lane, W.C.2. 2508

THE London Hospital, Whitechapel, E.1, requires JUNIOR ARCHITECTURAL ASSISTANT. Salary £440 to £650 p.a. according to experience, plus London weighting. Post superannuable. Applications stating age, present salary and brief particulars of experience to be sent to the House Governor. Accommodation is available in Kensington if successful candidate is a woman. 2677

ARCHITECTURAL ASSISTANT required in busy London Office with varied practice. Good salary and prospects for suitable applicant. 5-day week. Write giving particulars of age, qualifications, experience, etc., to Box 736, c/o 7, Coptic St., W.C.1. 2826

RHODESIA: Established firm of Chartered Architects require TWO ASSISTANTS with several years' good experience. One for Salisbury and other for Ndola. Single men preferred, salaries from £700 p.a. on three-year contracts with small and increasing bonus each year. Further details quoting: OSS.22/5, from Overseas Technical Service, 5, Welldon Crescent, Harrow, Middx. 3189

CO-OPERATIVE WHOLESALE SOCIETY LTD., ARCHITECT'S DEPARTMENT, LONDON.

ASSISTANT ARCHITECTS, WORKER-UP AND SHOP FITTING DRAUGHTSMAN. Applications are invited from suitably qualified persons. Salary on a scale £485—£945 inclusive of L.W., with placing according to age, qualifications and experience. The posts are superannuable, subject to medical examination. Five-day week in operation. Applications stating age, experience, qualifications and salary required to.—W. J. Reed, F.R.I.B.A., Chief Architect, Co-operative Wholesale Society Ltd., 99, Leman Street, London, E.1. 2824

CO-OPERATIVE WHOLESALE SOCIETY LTD., ARCHITECT'S DEPARTMENT, BIRMINGHAM.

APPLICATIONS are invited for the following appointments in a newly formed Branch Office. Interesting and varied commercial and industrial projects.

(A) SENIOR ASSISTANT ARCHITECT with experience in store and shop design.

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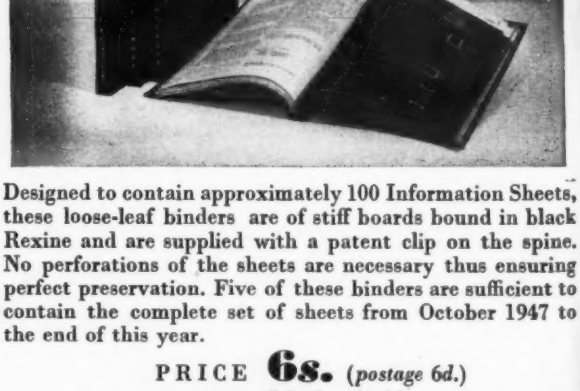

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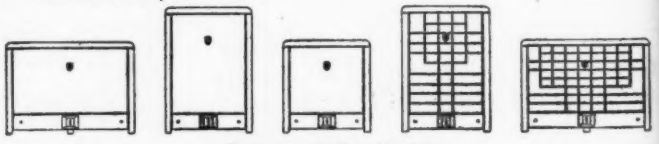

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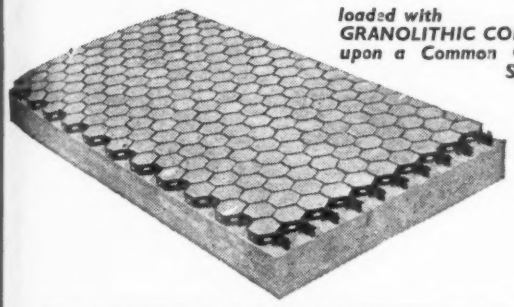

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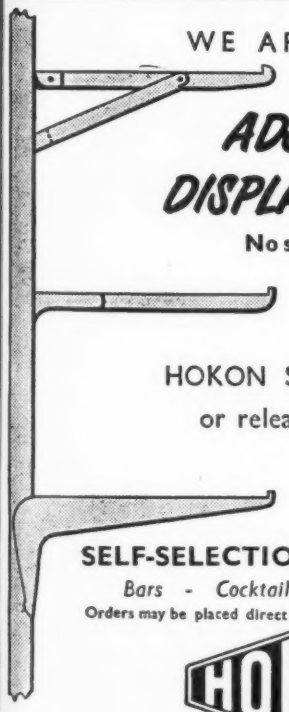

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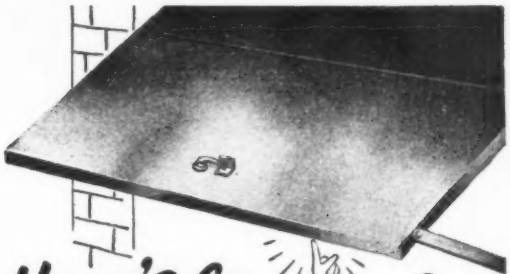

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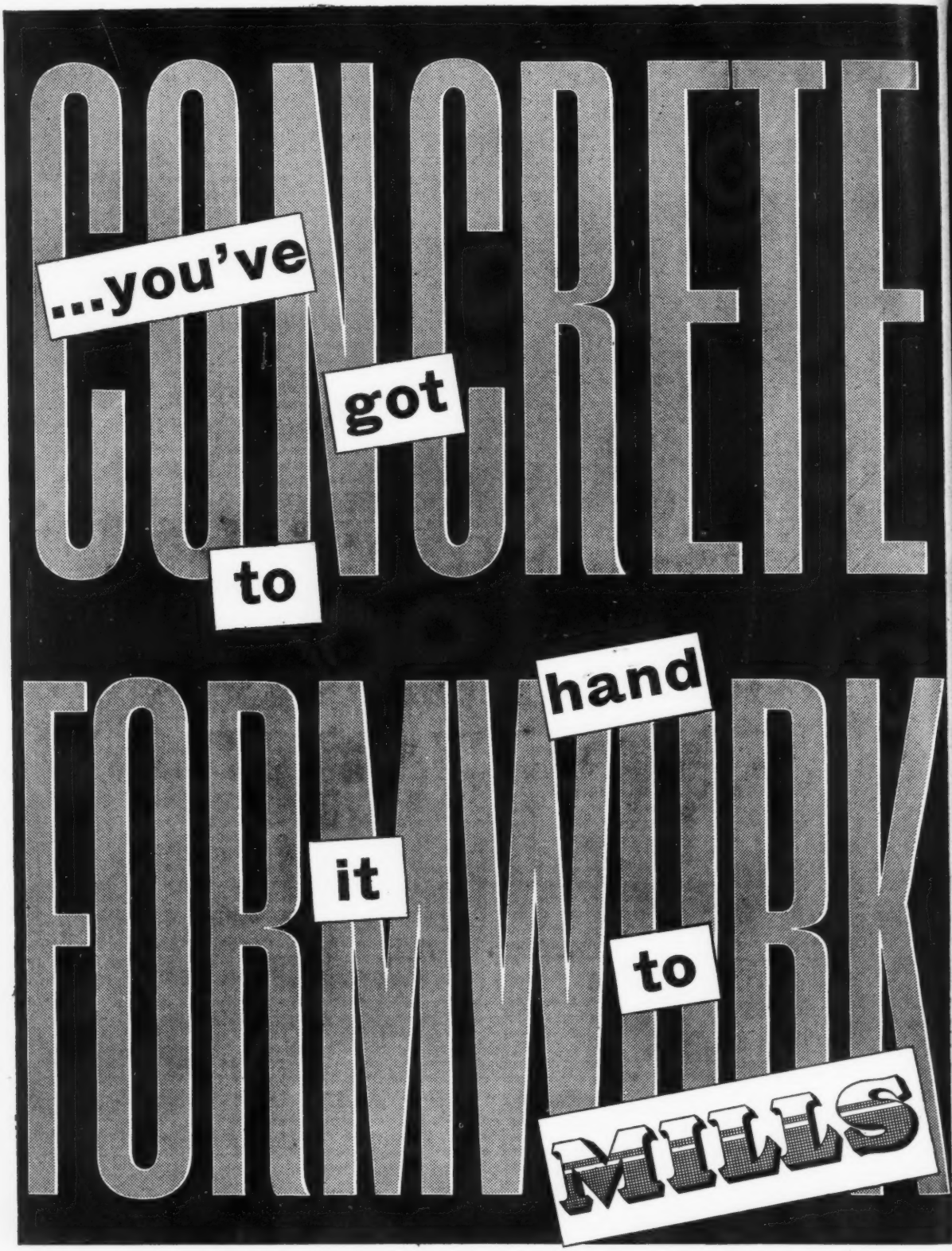

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